

# VEGETATION OF EAST GIPPSLAND

by

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## ABSTRACT

East Gippsland, Victoria, was surveyed between June 1979 and May 1980, employing a floristics-based, quadrat-sampling technique. Data from 590 quadrat sites were analysed via a computer-based, numerical sorting and classification procedure to determine the major floristic vegetation types within the area. These types were then arranged into 21 floristic 'communities', each of which is comprised of one or more floristically distinct 'sub-communities'. The sub-communities and their distribution are outlined in this paper, and include alpine and coastal heathlands, montane and lowland closed-forest, open-forests and saltmarsh vegetation.

## INTRODUCTION

This paper presents the results of a vegetation survey of East Gippsland. Its purpose is to define and describe the major floristic vegetation types of the study area, and to outline the distribution and environmental range of each.

## THE STUDY AREA

East Gippsland is defined as all land in Victoria east of 148°00'00"E (fig. 1a) (Leeper, 1969). This definition was adopted for the present survey, but with the exclusion of land north of 36°35'00"S. Major topographical features include the Cobberas (north-west), the Nunniong Plateau (west), the Errinundra Plateau (central) and Mt. Tingaringy (north-central). The highest peak is Mt. Cobberas No. 1 (1820m.) and is situated on the Great Dividing Range. The upper Murray River catchment is enclosed north of the Divide, whilst major rivers south of the Divide are (from west to east): the Snowy, Bemm, Cann, Thurra, Mueller, Wingan and Genoa Rivers (figure 1b). Of these only the Genoa and Snowy Rivers have any of their catchment outside the study area. The Snowy River is dammed at Lake Jindabyne in N.S.W. to supply water to a major hydro-electric scheme.

The study area is approximately 1,360,000 hectares (about 5.5% of Victoria), of which about 85% is public land. The main controlling authorities for this land are the Forests Commission, the National Parks Service and the Department of Crown Lands and Survey (L.C.C., 1977). The remaining 15% is private land, about two-thirds of which has been cleared for agriculture (mostly grazing). Orbost is the largest town and is surrounded by the most extensive farmlands of the study area. Other agricultural regions include the Buchan district, the area north of Buchan through Gelantipy to the Wulgulmerang Plateau, the Deddick River valley, Bonang, Bendock and the Cann River valley north of Cann River.

## THE SURVEY

### Method

#### FIELD WORK

The procedure followed was the same as outlined in Gullan *et al.* (1981). Four sites, each approximately 1000m<sup>2</sup>, were sampled within a rectangle of 5 minutes latitude and 5 minutes longitude. Each site sampled constituted a single uniform habitat, and was, where possible, environmentally distinct from each other site within the rectangle. Sampling intensity was occasionally increased in rectangles with a wide diversity of vegetation types.

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*Muelleria* 5(1): 53-113 (1982).



Fig. 1. a— Location of the study area. Hatching represents the area actually sampled. b— The study area. Different hatching represents different altitude ranges.

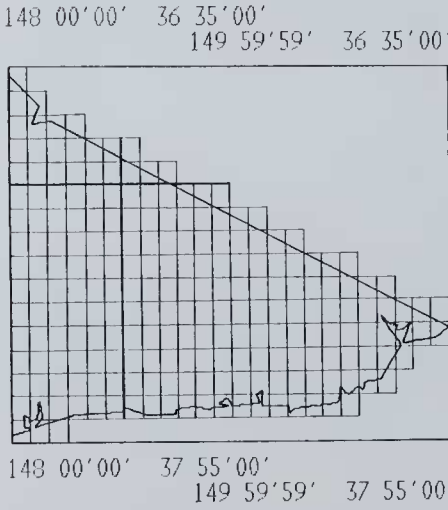


Fig. 2. The 5' latitude x 5' longitude grid system superimposed on a map of the study area.

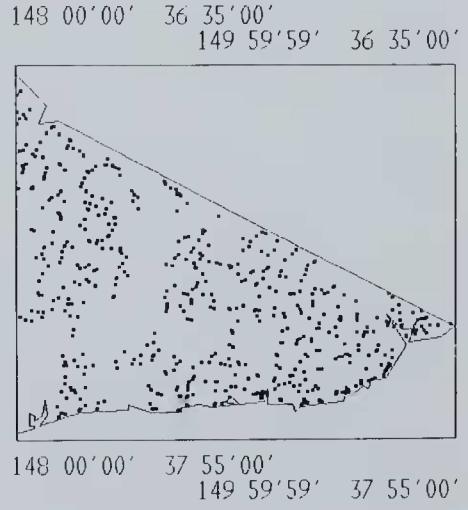


Fig. 3. Distribution of sample sites within the study area.

The study area included 194 rectangles (fig. 2), of which 158 were sampled with a total of 590 sites (fig. 3). The remaining 36 rectangles were not sampled due to inaccessibility and time constraints.

Data were collected during 9 field trips, each of 12 days duration. Each trip has been allotted an identifier from 12 (first trip) to 20 (last trip). Sample sites on each trip were numbered sequentially. Thus site 14049 indicates site 049 of trip 14. The base camps for each trip were as follows:

- |                   |                |                  |
|-------------------|----------------|------------------|
| 12. Croajingalong | 15. Deddick    | 18. Gelantipy    |
| 13. Marlo         | 16. Errinundra | 19. Cobberas     |
| 14. Orbost        | 17. Mallacoota | 20. Coopracambra |

## PLANT IDENTIFICATION

Where possible, all species were identified and recorded on site. Material that required more thorough examination and comparison with reference material was collected and identified at the National Herbarium. Nomenclature follows that of Willis (1970, 1972) with amendments by Todd (1979). The determination of certain suites of species posed particular difficulties, and for these nomenclatural qualifications have been made. These groups are outlined here but for further discussion of the taxonomic difficulties see Gullan *et al.* (1981):

- Eucalyptus rubida* and *E. dalrympleana*—were recorded as *E. rubida*
- Geranium potentilloides*, *G. solanderi* and *G. retrorsum* (where non-fertile)—recorded as *G. potentilloides*
- Gnaphalium spicatum* and *Gamochaeta purpurea*—recorded as *G. spicatum*
- Hydrocotyle hirta*, *H. laxiflora* and *H. algida* (where non-fertile)—recorded as *H. hirta*
- Juncus* spp. (sect. *Genuini*)—recorded as *Juncus* spp.
- Luzula* spp.—recorded as *L. campestris* spp. agg.
- Plantago varia* group—recorded as *P. varia*
- Poa australis* group—recorded as *P. australis* spp. agg.
- Ranunculus lappaceus* and *R. pachycarpus* (where non-fertile)—recorded as *R. lappaceus*
- Rubus fruticosus* group—recorded as *R. fruticosus* spp. agg.

## DATA STORAGE AND ANALYSIS

Information from each site (floristics, locality, altitude and sampling date) was stored permanently on magnetic disk. These data were assessed and manipulated via a numerical, classificatory computer program. Presentation of the analysis was by two-way tables which were successively refined using a hand-sorting procedure (Gullan, 1978).

In excess of 1000 species of vascular plant were recorded during the study. Only a portion of these are presented on two-way tables, as most species occur in less than 10% of sites, and add little to the overall vegetation description. (for full explanation of the two-way tables see Gullan *et al.* 1981).

## Terminology

Terminology associated with the vegetation classification follows that of Gullan *et al.* (1981). Specific terms are discussed briefly here.

**SUB-COMMUNITY**—is a group of sample sites which have a similar floristic composition (= "nodum" Poore, 1955). It is the basic unit of vegetation used in this paper.

**COMMUNITY**—is one or more sub-communities which have floristic and environmental affinities. The community may represent a floristic continuum along which arbitrary divisions have been made to form sub-communities. It may also represent a collection of sub-communities which are considered to be temporal phases of one vegetation after different disturbances (e.g. fire, grazing).

**CHARACTER SPECIES**—are determined as follows:

- where F = frequency of species in a sub-community and
- Q = number of sample sites in the sub-community,
- if  $Q \leq 10$ , then those species where  $F > 55\%$  are characteristic
- if  $Q \geq 50$ , then those species where  $F > 35\%$  are characteristic
- if  $10 < Q < 50$ , then those species where  $F > \text{or} = (55 - (Q - 10) / 2)\%$  are characteristic.

This definition is explained further in Gullan *et al.* (1981). Standard use of the term is detailed in Mueller-Dombois & Ellenberg (1974).

**COMMUNITY NAMES**—have been designed to convey, in commonly used terminology, an impression of the vegetation. Where appropriate the same community names as in Gullan *et al.* (1981) have been applied (e.g. Wet Sclerophyll Forest, Montane Sclerophyll Woodland).

**OPPORTUNISTIC SPECIES**—are those species whose cover value increases dramatically as a result of disturbance. Shrubs, especially members of the Papilionaceae (e.g. *Pultenaea* spp., *Daviesia* spp.) and Asteraceae (*Cassinia* spp., *Olearia* spp.) and many herbs (*Tetrarrhena juncea*, *Senecio* spp.) commonly exhibit this characteristic. The cover value of such species is usually low in undisturbed forest, but may be as great as 100% after disturbance. Fire, forestry operations and clearing for agriculture are the main agents of this disturbance.

### Limitations and Qualifications

#### FLORISTICS

As each quadrat was sampled only once, ephemeral species were often not in evidence (see previous remarks on Plant Identification).

#### DISTRIBUTION OF VEGETATION TYPES

The distribution maps provided in the RESULTS section show sites where a sub-community is present. They should not be interpreted as vegetation maps.

#### WEED PROBLEM

Substantially native vegetation was always chosen for quadrat sites. Thus the index of introduced species generally understates the weed problem of a district.

## RESULTS

Information is displayed in an accessible form, viz.:

### Two-way Tables

Tables 1 to 6 present the salient information from the survey and show:

- a. the quadrats comprising each community and sub-community.
- b. the species characterising communities and sub-communities.
- c. the relationships and differences between communities and sub-communities.
- d. the variation within communities and sub-communities.
- e. the distribution of common, although generally not characteristic, species within communities.
- f. the cover-abundance of each species in each quadrat.

### Community Descriptions

Twenty-one communities, representing the major, extant vegetation types, are defined for East Gippsland. It is probable that other communities existed prior to the rather intensive utilisation of land in certain areas. Some communities (and almost certainly some sub-communities) of very restricted or isolated occurrence may not have been encountered during the study (e.g. the *Eucalyptus fraxinoides* dominated tall open-forests of the eastern Howe Range). Other vegetation may have been sampled with insufficient frequency to enable satisfactory delineation. The absence of 53 sites (out of 590 sites sampled) from the two-way tables is partly attributable to this factor. Sites of heavily disturbed vegetation also contribute to this deficit. Gross disturbance, usually as a result of forestry operations or recent fire, promotes a vegetation which is species-poor and consequently, impossible to accurately assign to a community.

The following is a brief description of each of the major communities:

**EG COMMUNITY 1:** Alpine Wet Heathlands (2 sub-communities; 19 sites).

Closed-heath to low woodlands of plains and damp depressions in the high country from the Cobberas to Mt. Bowen.

**EG COMMUNITY 2:** Montane Riparian Forest (1 sub-community; 5 sites).

Closed-scrub to open-forest along gullies and stream margins in the high country.

- EG COMMUNITY 3: Montane Forest (1 sub-community; 6 sites).  
Tall open-forest of sheltered sites in high country from the upper reaches of the Snowy River to the Cobberas.
- EG COMMUNITY 4: Snow Gum Woodlands (1 sub-community; 18 sites).  
Low woodland of subalpine ridges throughout the study area.
- EG COMMUNITY 5: Montane Sclerophyll Woodland (3 sub-communities; 29 sites).  
A woodland community typical of montane skeletal soils with low effective rainfall.
- EG COMMUNITY 6: (2 sites).  
Insufficient sites have been sampled to adequately describe this vegetation type. Field experience suggests this is a subalpine variant of sub-community EG 11.1. This subalpine rocky outcrop scrubland is characterised by the mallee-like *Eucalyptus glaucescens* and a closed shrub layer.
- EG COMMUNITY 7: Cool Temperate Rainforest (1 sub-community; 8 sites).  
Closed-forest of wet montane gullies and sheltered slopes within the area bounded by Bonang, Mt. Ellery and Mt. Coopracambra.
- EG COMMUNITY 8: Wet Sclerophyll Forest (4 sub-community; 52 sites).  
Tall open-forest of well-watered slopes of the eastern ranges, from near Mt. Bowen through to Mt. Coopracambra.
- EG COMMUNITY 9: Dry Sclerophyll Forest (4 sub-communities; 42 sites).  
Open-forest or woodland of foothills throughout the area.
- EG COMMUNITY 10: Box-Ironbark Woodland (1 sub-community; 10 sites).  
This woodland is typical of dry slopes and ridges with skeletal soils in lowland Victoria, but is of sporadic occurrence within the study area.
- EG COMMUNITY 11: Rocky Outcrop Open-scrubland (1 sub-community; 11 sites).  
This community has a diversity of sub-communities in the field. However, further sampling would be necessary to represent these adequately. Mallee forms of a number of eucalypts above a variable shrub layer are characteristic. Concentrated in the upper Snowy River area.
- EG COMMUNITY 12: Warm Temperate Rainforest (1 sub-community; 23 sites).  
Closed-forest of gully-heads and streamsides in lowland to foothill country. Rare to the west of the Snowy River but scattered throughout the remaining lowlands.
- EG COMMUNITY 13: Riparian Forest (3 sub-communities; 73 sites).  
Floristically rich, open-forest of wet slopes and riversides of all major waterways in the area. A tall shrub layer of mesophytic species is common within this community.
- EG COMMUNITY 14: Rain-shadow Woodland (3 sub-communities; 23 sites).  
A woodland of dry, gravelly sites of the north-east, especially in the vicinity of the Snowy River at the New South Wales border. *Eucalyptus albens* and *Callitris columellaris* are the common trees, but shrub and ground layer plants are sparsely distributed.
- EG COMMUNITY 15: Banksia Woodland (1 sub-community; 30 sites).  
Woodland scattered on coastal lowlands from the Snowy River to the Victoria-New South Wales border. Although inland from full oceanic influence, it rarely extends far from the coast.
- EG COMMUNITY 16: Lowland Sclerophyll Forest (5 sub-communities; 106 sites).  
Open-forest of coastal lowlands throughout the study area. It is the best represented community in East Gippsland.
- EG COMMUNITY 17: Coastal Heathland (4 sub-communities; 32 sites).  
Open- and closed-heathlands distributed throughout the damp, lowland plains to 20 km inland. *Xanthorrhoea hastilis* and *Casuarina*

*paludosa* dominate two distinct sub-communities which may form extensive, treeless stands.

EG COMMUNITY 18: Coastal Sclerophyll Forest (1 sub-community; 29 sites).

A mixed-eucalypt open-forest distributed throughout the low-land regions but at lower elevations than Community 15. Particularly well-developed around Mallacoota and Orbost districts.

EG COMMUNITY 19: Coastal Banksia Woodland (1 sub-community; 6 sites).

A woodland of wet, sheltered sites, fringing near coastal waters such as Ewing Marsh, Tamboon Inlet and other estuaries. Dense thickets of *Gahnia clarkei* and *Melaleuca ericifolia* are characteristic of this community.

EG COMMUNITY 20: Primary Dune Scrub (1 sub-community; 6 sites).

Primary dune or seacliff community containing sand-accreting grasses, herbs and low shrubs. Taller shrubs occur on the leeward slopes and swales.

EG COMMUNITY 21: Saltmarsh (1 sub-community; 3 sites).

A community generally dominated by the tussock-rush *Juncus kraussii*, fringing estuarine waters of Sydenham, Tamboon, Wingan and Mallacoota Inlets. Salt-tolerant sapphire plants frequent in other saltmarsh communities (low shrubland) are less common but may contribute significantly to the species composition.

### Sub-community Summary Sheets

#### DISTRIBUTION MAPS

A diagrammatic representation of the distribution of all sites sampled has been produced for each sub-community. The distribution of all its constituent sites has been superimposed on a map of the study area together with major rivers and features.

#### CHARACTER SPECIES TABLES

In these tables, only those species which are characteristic of a sub-community are listed. The ranking of the species in these tables is in order of their frequencies in the sub-communities. These values are listed along with the average cover-abundance values of the species. This order allows ready assessment of individual sub-communities. The two-way table presentation however, enables the interrelationships between sub-communities and communities to be more easily interpreted.

#### SUB-COMMUNITY DESCRIPTIONS AND ANNOTATIONS

A simple description outlining distribution, environment and any special features has been made for each sub-community. Included with these descriptions are details of altitude, vegetation structure, floristic richness and weed composition.

### ACKNOWLEDGEMENTS

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Table 3. Two-way table of Communities 9, 10 and 11.

COMMUNITY	9	10	11			
SUB-COMMUNITY	1	2	3	4	1	1
SPECIES						
<i>Coprosma quadrifida</i>	1	+				
<i>Veronica calycina</i>	+	+	+		+	
<i>Acacia dealbata</i>	+		+		+	
<i>Glycine clandestina</i>	1	1				
<i>Tetraloche baueifolia</i>	+	+	+		+	
<i>Dianella tasmanica</i>	+	+	+	+		
<i>Pullenaea juniperina</i>	+	+		+	+	
<i>Stellaria pungens</i>	+	+				
<i>Senecio quadridentatus</i>	+	+				
<i>Acrotiche prostrata</i>	+	+				
<i>Fucalypus dives</i>	+	+				
<i>Indigofera australis</i>	+	+				
<i>Acrotiche serrulata</i>	+	+				
<i>Astroloma humifusum</i>	+	+				
<i>Gonocarpus tetragynus</i>	+	+				
<i>Hardenbergia violacea</i>	+	+				
<i>Danthonia pallida</i>	+	+				
<i>Hibbertia obtusifolia</i>	+	+				
<i>Dichelachne micrantha</i>	+	+				
<i>Helichrysum scopioides</i>	+	+				
<i>Epacris impressa</i>	+	+				
<i>Acacia melanoxylon</i>	+	+				
<i>Gahnia radula</i>	+	+				
<i>Fucalypus bridgesiana</i>	+	+				
<i>Fucalypus radiata</i>	+	+				
<i>Leucopogon lanceolatus</i>	+	+				
<i>Personia linearis</i>	+	+				
<i>Davidia ulicifolia</i>	+	+				
<i>Acacia mucronata</i>	+	+				
<i>Gonocarpus strictus</i>	+	+				
<i>Gonocarpus tetraxoides</i>	+	+				
<i>Tetraphena juncea</i>	+	+				
<i>Nematitis aristata</i>	+	+				
<i>Dianella caerulea</i>	+	+				
<i>Fucalypus cypellocarpa</i>	+	+				
<i>Viola hederacea</i>	+	+				
* <i>Hypochoeris radicata</i>	+	+				
<i>Hypericum gramineum</i>	+	+				

<i>Coprosma quadrifida</i>	+
<i>Veronica calycina</i>	+
<i>Acacia dealbata</i>	+
<i>Glycine clandestina</i>	+
<i>Tetraloche baueifolia</i>	+
<i>Dianella tasmanica</i>	+
<i>Pullenaea juniperina</i>	+
<i>Stellaria pungens</i>	+
<i>Senecio quadridentatus</i>	+
<i>Acrotiche prostrata</i>	+
<i>Fucalypus dives</i>	+
<i>Indigofera australis</i>	+
<i>Acrotiche serrulata</i>	+
<i>Astroloma humifusum</i>	+
<i>Gonocarpus tetragynus</i>	+
<i>Hardenbergia violacea</i>	+
<i>Danthonia pallida</i>	+
<i>Hibbertia obtusifolia</i>	+
<i>Dichelachne micrantha</i>	+
<i>Helichrysum scopioides</i>	+
<i>Epacris impressa</i>	+
<i>Acacia melanoxylon</i>	+
<i>Gahnia radula</i>	+
<i>Fucalypus bridgesiana</i>	+
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<i>Personia linearis</i>	+
<i>Davidia ulicifolia</i>	+
<i>Acacia mucronata</i>	+
<i>Gonocarpus strictus</i>	+
<i>Gonocarpus tetraxoides</i>	+
<i>Tetraphena juncea</i>	+
<i>Nematitis aristata</i>	+
<i>Dianella caerulea</i>	+
<i>Fucalypus cypellocarpa</i>	+
<i>Viola hederacea</i>	+
* <i>Hypochoeris radicata</i>	+
<i>Hypericum gramineum</i>	+





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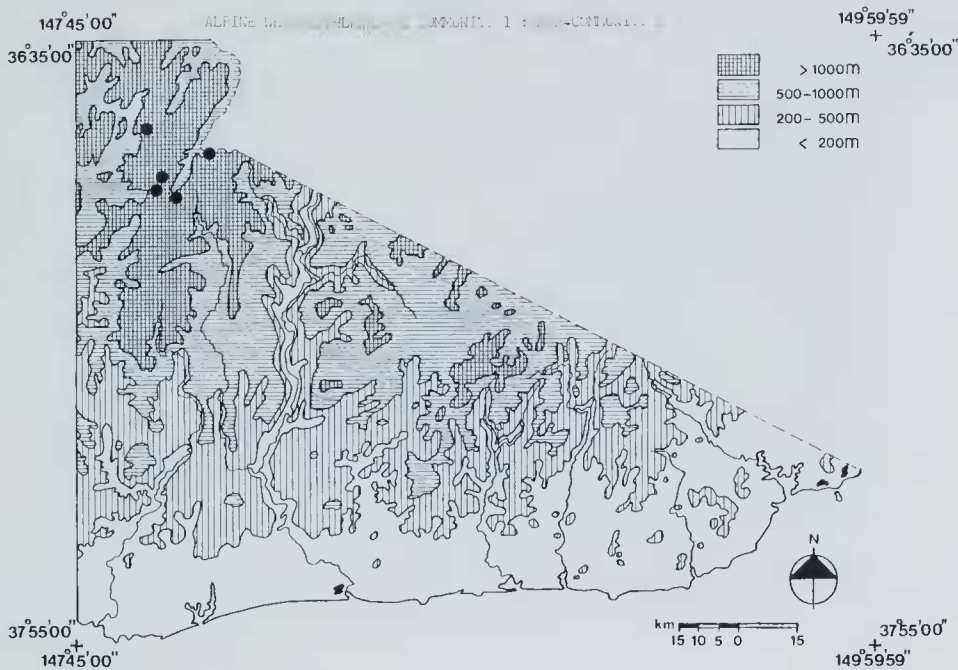












CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Agropyron scabrum</i>	100	1	<i>Epacris breviflora</i>	80	1	<i>Ranunculus lappaceus</i>	60	+
<i>Carex appressa</i>	100	1	<i>Epacris microphylla</i>	80	1	<i>Baeckea utilis</i>	60	1
<i>Carex gaudichaudiana</i>	100	1	<i>Epilobium gunnianum</i>	80	+	<i>Blechnum pennsylvanicum</i>	60	1
<i>Eucalyptus stellulata</i>	100	1	<i>Gratiola peruviana</i>	80	1	<i>Brachycome scapigera</i>	60	+
<i>Gnaphalium japonicum</i>	100	1	<i>Hydrocotyle sibthorpioides</i>	80	+	<i>Callistemon sieberi</i>	60	1
* <i>Holcus lanatus</i>	100	1	* <i>Juncus acutiflorus</i>	80	+	<i>Empodisma minus</i>	60	1
<i>Hypericum japonicum</i>	100	1	<i>Leptospermum myrtifolium</i>	80	1	<i>Carex longibrachiata</i>	60	1
* <i>Hypochoeris radicata</i>	100	1	<i>Oreomyrrhis ciliata</i>	80	1	<i>Craspedia glauca</i>	60	+
<i>Poa australis</i> spp. agg.	100	2	<i>Ranunculus pimpinellifolius</i>	80	1	<i>Deyeuxia quadriseta</i>	60	+
<i>Prunella vulgaris</i>	100	1	<i>Restio australis</i>	80	1	<i>Dichelachne micrantha</i>	60	+
<i>Rubus parvifolius</i>	100	1	<i>Rumex brownii</i>	80	+	<i>Epilobium cinereum</i>	60	1
<i>Acaena anserinifolia</i>	80	1	<i>Blechnum minus</i>	60	+	<i>Geranium antrorsum</i>	60	+
<i>Geranium potentilloides</i>	80	+	<i>Eucalyptus camphora</i>	60	1	<i>Gonocarpus micranthus</i>	60	+
<i>Stellaria pungens</i>	80	1	<i>Ranunculus rivularis</i>	60	1	<i>Oreomyrrhis eriopoda</i>	60	+
* <i>Trifolium repens</i>	80	1	<i>Asperula gunnii</i>	60	+	<i>Scleranthus biflorus</i>	60	+
<i>Asperula scoparia</i>	80	1	* <i>Cerastium glomeratum</i>	60	+	<i>Themeda australis</i>	60	1
* <i>Cirsium vulgare</i>	80	+	<i>Leucopogon suaveolens</i>	60	1	<i>Juncus</i> spp.	60	1
<i>Dichondra repens</i>	80	1	<i>Myriophyllum propinquum</i>	60	1			

NO. OF SITES: 5 (0.6% of total)

DISTRIBUTION: Upper Murray and upper Buchan River catchments.

ENVIRONMENT: Surrounds of meandering streams on subalpine plains, commonly with strong peat development and associated poor drainage

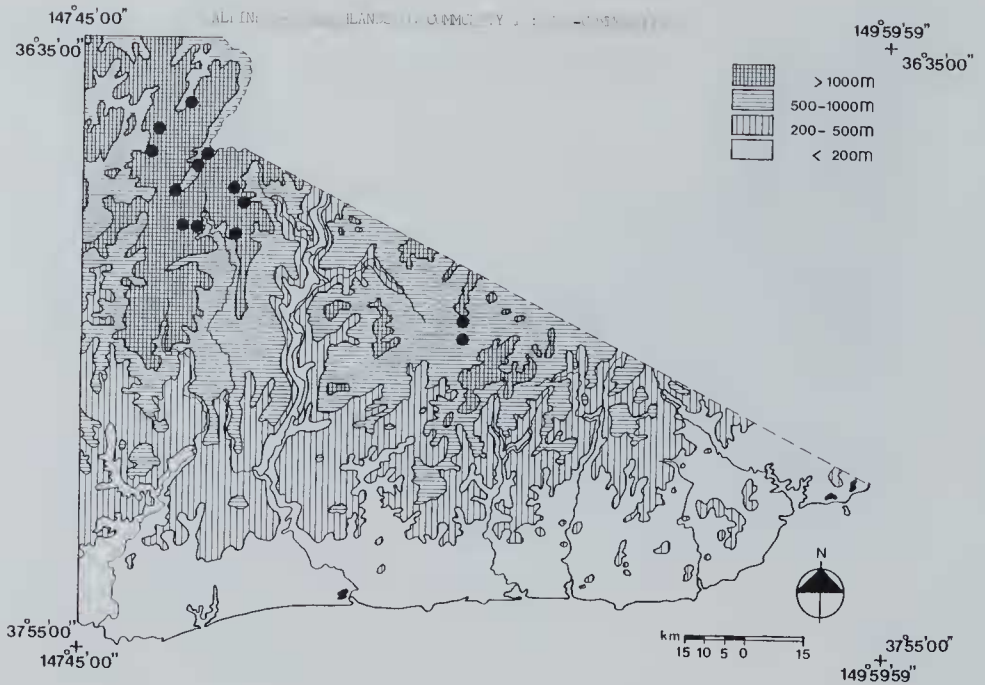
ALTITUDE: Mean = 1092 m, Highest = 1200 m, Lowest = 1000 m.

STRUCTURE: Low open-woodland to Closed-heath

MEAN FLORISTIC RICHNESS: 68 species per site

MEAN WEED COMPOSITION: 13% of species, 11% of cover

NOTES: Occasional eucalypts above a varied understory of grasses, sedges and forbs give this sub-community an open park-like appearance. Scattered clumps or swathes of small-leaved sclerophyllous shrubs are also present. *Eucalyptus stellulata* and *E. camphora* are typical of poorly drained, sheltered subalpine plains; the latter being most common where perennial standing water is found. Hydrophytes including *Myriophyllum propinquum* and *Ranunculus rivularis* grew in this free water. Disturbance of the sites of this sub-community through cattle grazing is reflected by the consistent occurrence of ruderal species (e.g. *Holcus lanatus*, *Trifolium repens* and *Cirsium vulgare*). The majority of herbs occurring in 80% or more quadrats are cosmopolitan, riparian species.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Asperula gunnii</i>	93	+	<i>Gonocarpus micranthus</i>	79	1	<i>Acaena anserinifolia</i>	57	1
<i>Epacris microphylla</i>	93	1	<i>Oreomyrrhis ciliata</i>	79	1	<i>Hydrocotyle sibthorpioides</i>	57	+
<i>Poa australis</i> spp. agg.	93	1	<i>Stylidium graminifolium</i>	71	1	<i>Scirpus merrillii</i>	57	+
<i>Vestio australis</i>	93	1	<i>Craspedia glauca</i>	71	+	<i>Baeckea gunniana</i>	57	2
<i>Sphodisma minus</i>	86	1	<i>Leptospermum grandifolium</i>	64	1	<i>Comesperma retusum</i>	57	1
<i>Hypericum japonicum</i>	86	1	<i>Hakea microcarpa</i>	64	1	<i>Eucalyptus pauciflora</i>	57	1
<i>Luzula campestris</i> spp. agg.	86	+	<i>Brachycome scapigera</i>	64	1	<i>Eucalyptus stellulata</i>	57	1
<i>Cotula alpina</i>	86	1	<i>Callistemon sieberi</i>	64	1	<i>Leptospermum myrtifolium</i>	57	1
<i>Epacris breviflora</i>	86	1	* <i>Hypochoeris radicata</i>	64	+			

NO. OF SITES: 14 (1.4% of total)

DISTRIBUTION: Upper Murray, upper Buchan and Delegate River catchments about the Cobberas, Mt. Nunniong and northern Errinundra Plateau.

ENVIRONMENT: Open alpine and subalpine plains, commonly with strong peat development and associated poor drainage

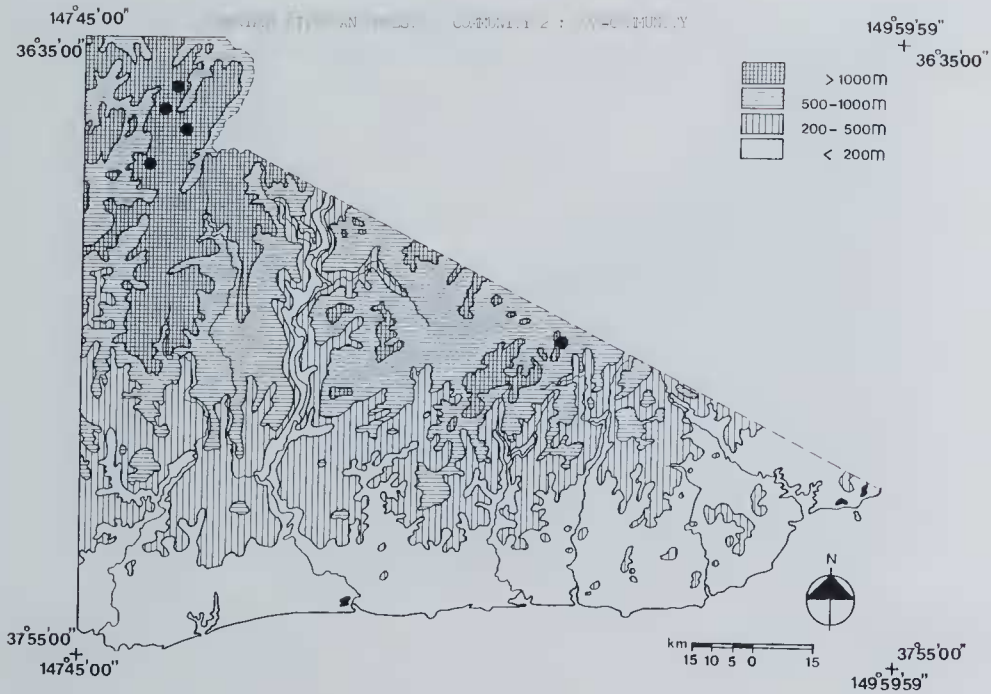
ALTITUDE: Mean = 1259 m, Highest = 1520 m, Lowest = 870 m.

STRUCTURE: Low open-woodland to Closed-heath

MEAN FLORISTIC RICHNESS: 49 species per site

MEAN WEED COMPOSITION: 3% of species, 2% of cover

NOTES: Although classed as a closed wet heath occasional eucalypts may be present above the small-leaved sclerophyllous shrub layer. *Sphagnum* spp. generally form a carpeting ground layer. In contrast to sub-community 1.1, this sub-community has little evidence of disturbance.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Acaena anserinifolia</i>	100	1	<i>Leucopogon suaveolens</i>	80	1	<i>Gaultheria appressa</i>	60	1
<i>Carex appressa</i>	100	2	<i>Scirpus merrillii</i>	80	1	<i>Juncus sarophorus</i>	60	1
<i>Gnaphalium japonicum</i>	100	+	<i>Stellaria pungens</i>	80	+	<i>Olearia megalophylla</i>	60	+
<i>Lagenifera stipitata</i>	100	1	<i>Cotula filicula</i>	80	+	<i>Olearia phlogopappa</i>	60	+
<i>Leptospermum grandifolium</i>	100	2	<i>Deyeuxia brachyathera</i>	80	1	<i>Pultenaea juniperina</i>	60	1
<i>Poa australis</i> spp. agg.	100	1	<i>Dianella tasmanica</i>	80	1	<i>Acacia dealbata</i>	60	1
<i>Blechnum pennamarina</i>	80	1	<i>Mentha laxiflora</i>	60	+	<i>Blechnum minus</i>	60	1
<i>Tasmannia lanceolata</i>	80	1	<i>Asperula scoparia</i>	60	+	<i>Blechnum nudum</i>	60	1
<i>Geranium potentilloides</i>	80	+	<i>Epilobium gunnianum</i>	60	+	<i>Polystichum proliferum</i>	60	1

NO. OF SITES: 5 (0.8% of total)

DISTRIBUTION: Mt. Misery area (upper Murray River) and Errinundra Plateau.

ENVIRONMENT: Streamside of subalpine and montane valleys

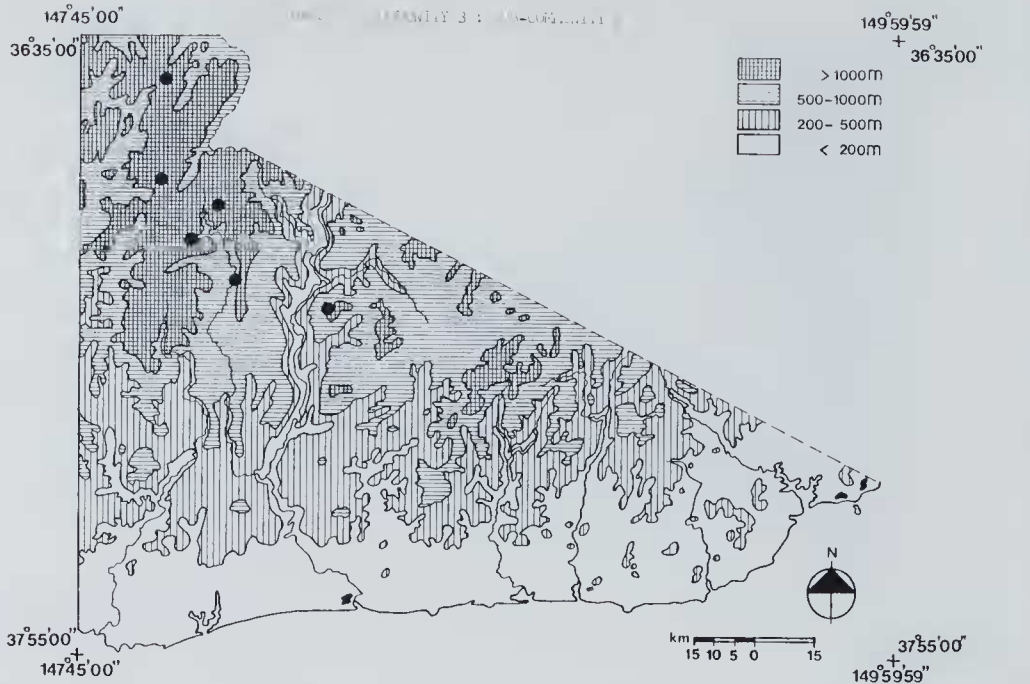
ALTITUDE: Mean = 1270 m, Highest = 1520 m, Lowest = 870 m.

STRUCTURE: Woodland to Tall open-forest

MEAN FLORISTIC RICHNESS: 43 species per site

MEAN WEED COMPOSITION: 4% of species, 3% of cover

NOTES: Although no eucalypts are character species of sub-community 2.1, *Eucalyptus delegatensis*, *E. rubida* or *E. pauciflora* are sometimes present. *Leptospermum grandifolium* often forms a closed-scrub on stream margins, but doesn't extend to drier sites. The understory consists of a mixture of small-leaved sclerophyllous species (e.g. *Leucopogon suaveolens*, *Pultenaea juniperina*) and broad-leaved species (e.g. *Gaultheria appressa*, *Tasmannia lanceolata*). The herb layer includes a range of ferns (*Blechnum* spp., *Polystichum proliferum*) and sedges (*Carex appressa*, *Scirpus merrillii*).



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Acacia dealbata</i>	100	1	<i>Stellaria pungens</i>	83	1	<i>Epilobium cinereum</i>	67	+
<i>Coprosma hirtella</i>	100	1	<i>Viola betonicifolia</i>	83	1	<i>Hydrocotyle hinta</i>	67	1
<i>Eucalyptus delegatensis</i>	100	2	<i>Polystichum proliferum</i>	67	1	<i>Lagenifera stipitata</i>	67	1
<i>Viola hereracea</i>	100	1	<i>Arthropodium milleflorum</i>	67	1	<i>Microseris scapigera</i>	67	+
<i>Acaena anserinifolia</i>	83	1	<i>Eucalyptus pauciflora</i>	67	1	* <i>Picris hieracioides</i>	67	1
<i>Asperula scoparia</i>	83	1	<i>Gonocarpus tetragynus</i>	67	1	<i>Poa australis</i> spp. agg.	67	2
<i>Clematis aristata</i>	83	+	<i>Helichrysum acuminatum</i>	67	1	<i>Pultenaea juniperina</i>	67	1
<i>Craspedia glauca</i>	83	1	<i>Luzula campestris</i> spp. agg.	67	+	<i>Ranunculus plebeius</i>	67	1
<i>Geranium potentilloides</i>	83	+	<i>Cotula filicula</i>	67	1	<i>Veronica derwentia</i>	67	1
<i>Helichrysum scorpioides</i>	83	1	<i>Danthonia pilosa</i>	67	1	<i>Wahlenbergia gloriosa</i>	67	1

NO. OF SITES: 6 (1.0% of total)

DISTRIBUTION: Mt. Misery, Mt. Nunningong and Mt. Gelantipy districts.

ENVIRONMENT: Montane and subalpine sheltered valleys and south facing slopes

ALTITUDE: Mean = 1328 m, Highest = 1460 m, Lowest = 1200 m.

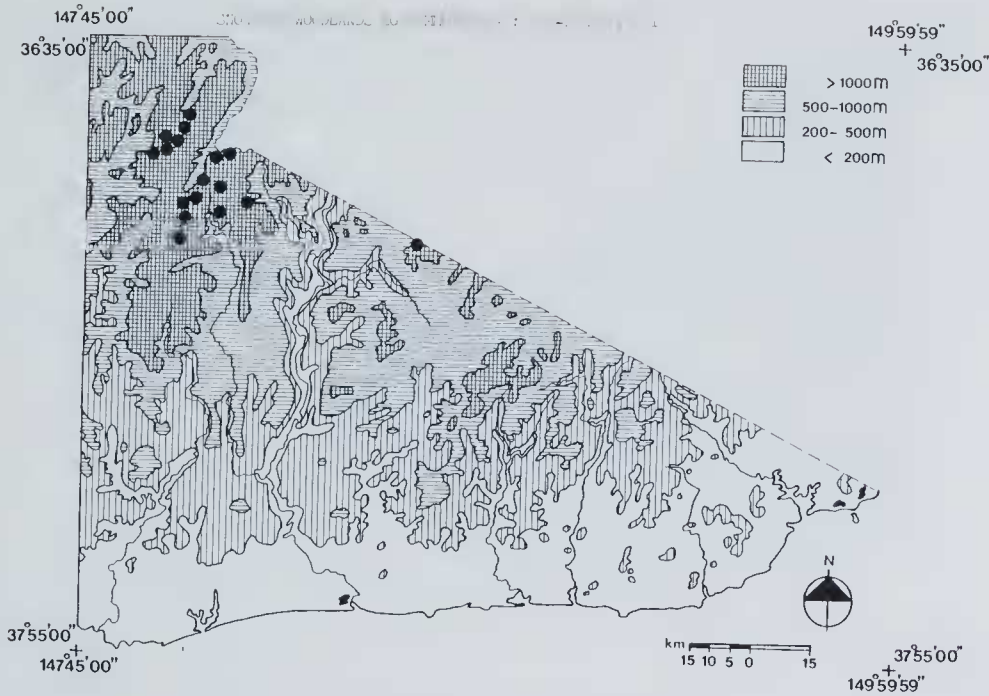
STRUCTURE: Tall open-forest

MEAN FLORISTIC RICHNESS: 41 species per site

MEAN WEED COMPOSITION: 3% of species, 2% of cover

NOTES: Montane forest generally has a sparse shrub layer, however fire or windfalls may encourage dense growth in limited areas. The herb layer usually approaches complete cover. The introduced species, *Picris hieracioides* is frequent in alpine and subalpine communities, and is often considered naturalized within them. *Eucalyptus delegatensis* is an important timber species, and in this sub-community virgin stands are presently being exploited. The open park-like understory and tall trees within this sub-community make it an attractive and imposing vegetation.





CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Eucalyptus pauciflora</i>	100	2	<i>Asperula scoparia</i>	83	1	<i>Carex breviculmis</i>	61	1
<i>Helichrysum scorpioides</i>	100	1	<i>Viola betonicifolia</i>	72	+	<i>Luzula campestris</i> spp. agg.	61	+
<i>Poa australis</i> spp. agg.	100	2	<i>Epilobium cinereum</i>	67	1	<i>Olearia erubescens</i>	61	1
<i>Stellaria pungens</i>	94	1	<i>Acæna anserinifolia</i>	67	1	<i>Anthropodium milleflorum</i>	61	+
<i>Craspedia glauca</i>	89	1	<i>Danthonia pilosa</i>	67	1	* <i>Hypochoeris radiata</i>	56	+
<i>Leucopogon suaveolens</i>	89	1	<i>Pultenaea juniperina</i>	67	1	<i>Senecio lautus</i>	56	+
<i>Brachycome aculeata</i>	89	1	<i>Daviesia ulicifolia</i>	61	1	<i>Styliidium graminifolium</i>	56	1

NO. OF SITES: 18 (3.0% of total)

DISTRIBUTION: Mt. Misery, Mt. Nunniong and Cobberas districts with an isolated occurrence near Mt. Tingaringy.

ENVIRONMENT: Subalpine ridges and adjacent slopes often with granite outcrops, well-drained soils

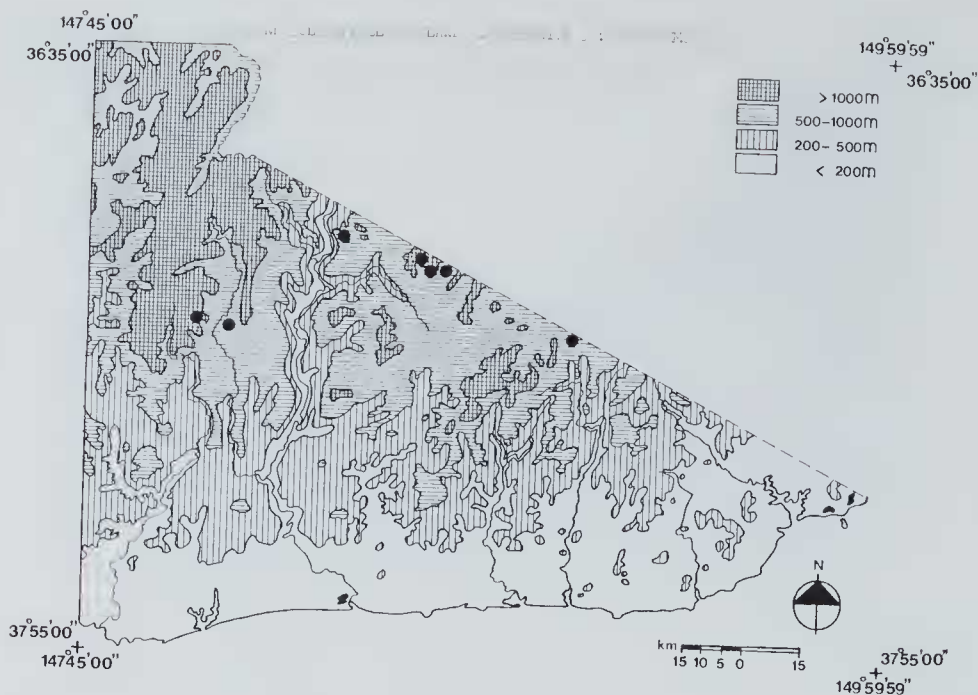
ALTITUDE: Mean = 1467 m, Highest = 1620 m, Lowest = 1320 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 37 species per site

MEAN WEED COMPOSITION: 3% of species, 2% of cover

NOTES: This snow gum (or white sallee) woodland is the predominant vegetation of the subalpine region. The sparse, low shrub layer is often dominated by a member of the Papilionaceae (e.g. *Daviesia ulicifolia*, *Pultenaea juniperina*) but *Leucopogon suaveolens* is more consistently present. The dominant ground cover species is *Poa australis* spp. agg. (tussock grass), which has been able to survive and capitalize on repeated burning and grazing. In many districts seasonal burning has been undertaken by cattlemen to increase "green pick" for cattle.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Eucalyptus dives</i>	100	1	<i>Hydrocotyle hirta</i>	75	1	<i>Pultenaea juniperina</i>	63	1
<i>Gonocarpus tetragynus</i>	88	1	<i>Viola hederacea</i>	75	1	<i>Geranium potentilloides</i>	63	1
<i>Poa australis</i> spp. agg.	88	2	<i>Cassinia longifolia</i>	63	1	<i>Stellaria pungens</i>	63	+
<i>Pteridium esculentum</i>	88	1	<i>Acacia dealbata</i>	63	1	<i>Eucalyptus obliqua</i>	63	1
<i>Lomandra longifolia</i>	75	1	<i>Luzula campestris</i> spp. agg.	63	+	* <i>Hypochoeris radicata</i>	63	+
<i>Eucalyptus rubida</i>	75	1						

NO. OF SITES: 5 (1.4% of total)

DISTRIBUTION: Mt. Nunniong, Mt. Timgaringy and Mt. Canterbury districts.

ENVIRONMENT: Skeletal soils on slopes, particularly of northern aspect

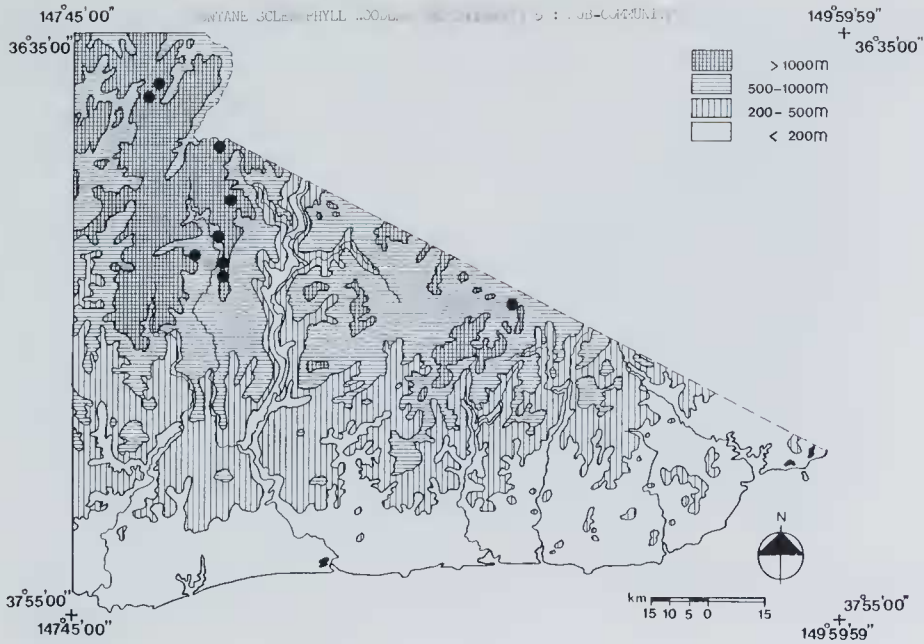
ALTITUDE: Mean = 996 m, Highest = 1150 m, Lowest = 840 m.

STRUCTURE: Woodland to Open-forest

MEAN FLORISTIC RICHNESS: 34 species per site

MEAN WEED COMPOSITION: 3% of species, 2% of cover

COMMENTS: The understorey consists of opportunistic shrubs and herbs common throughout the high country. Sub-community 5.1 is the highest altitude sub-community in which *Pteridium exultantum* is a character species.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Daviesia ulicifolia</i>	100	1	<i>Pultenaea juniperina</i>	80	2	<i>Tetratheca bauerifolia</i>	70	1
<i>Monotoca scoparia</i>	100	1	<i>Dichelachne micrantha</i>	80	1	<i>Brachycome aculeata</i>	60	+
<i>Poa australis</i> spp. agg.	100	1	<i>Eucalyptus dives</i>	70	1	<i>Dianella tasmanica</i>	60	1
<i>Stylidium graminifolium</i>	100	1	<i>Gonocarpus tetragynus</i>	70	+	<i>Epacris impressa</i>	60	1
<i>Eucalyptus pauciflora</i>	90	1	<i>Acacia dealbata</i>	70	1	<i>Helichrysum scorpioides</i>	60	+
<i>Lomandra longifolia</i>	90	1	<i>Eucalyptus rubida</i>	70	1	<i>Olearia erubescens</i>	60	1

NO. OF SITES: 10 (1.7% of total)

DISTRIBUTION: Wombargo, Cobberas and Mt. Misery districts with an isolated occurrence near Combenbar.

ENVIRONMENT: Impervious soils, on slopes especially of northern aspect

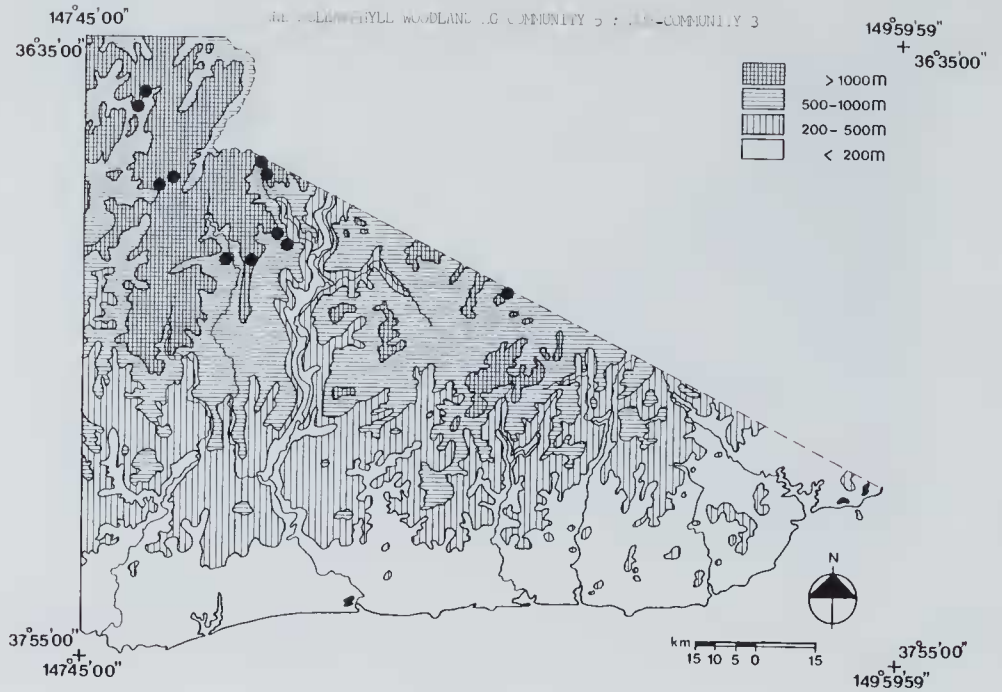
ALTITUDE: Mean = 1157 m, Highest = 1360 m, Lowest = 840 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 32 species per site

MEAN WEED COMPOSITION: 3% of species, 2% of cover

NOTES: The majority of character species in this sub-community are widespread, although a few of the woody species are typically found in the highlands (e.g. *Eucalyptus pauciflora*, *Olearia erubescens*, *Tetratheca bauerifolia*). This sub-community has many similarities with community 9 from which it has been differentiated by altitude. The dominant species in the shrub layer are members of the Papilionaceae (e.g. *Daviesia ulicifolia* and *Pultenaea juniperina*). The high cover values for one or both of these opportunistic species may reflect a high frequency of fire. This sub-community has the lowest number of character species within community 5, which reinforces fire as a significant factor.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Eucalyptus rubida</i>	100	1	<i>Hibbertia obtusifolia</i>	82	1	<i>Danthonia pilosa</i>	64	1
<i>Gonocarpus tetragynus</i>	100	1	<i>Themeda australis</i>	82	1	<i>Exocarpos strictus</i>	64	1
<i>Poa australis</i> spp. agg.	100	1	<i>Hypericum gramineum</i>	73	1	<i>Danthonia racemosa</i>	55	+
<i>Acrotriche serrulata</i>	91	1	<i>Pultenaea juniperina</i>	73	2	<i>Dichelachne micrantha</i>	55	1
<i>Eucalyptus pauciflora</i>	82	1	<i>Eucalyptus dives</i>	73	1	<i>Acacia dealbata</i>	55	1
<i>Lomandra longifolia</i>	82	1	<i>Platylobium formosum</i>	73	1	<i>Dianella revoluta</i>	55	+
<i>Brachyloma daphniodes</i>	82	1	* <i>Hypochoeris radicata</i>	64	+	<i>Stylidium graminifolium</i>	55	1
* <i>Centaurium pulchellum</i>	82	+	<i>Acaena anserinifolia</i>	64	+			

NO. OF SITES: 11 (1.9% of total)

DISTRIBUTION: Cobberas, Mt. Wombargo and Mt. Misery districts with an isolated occurrence near Mt. Delegate.

ENVIRONMENT: Impervious skeletal soils, usually north facing slopes

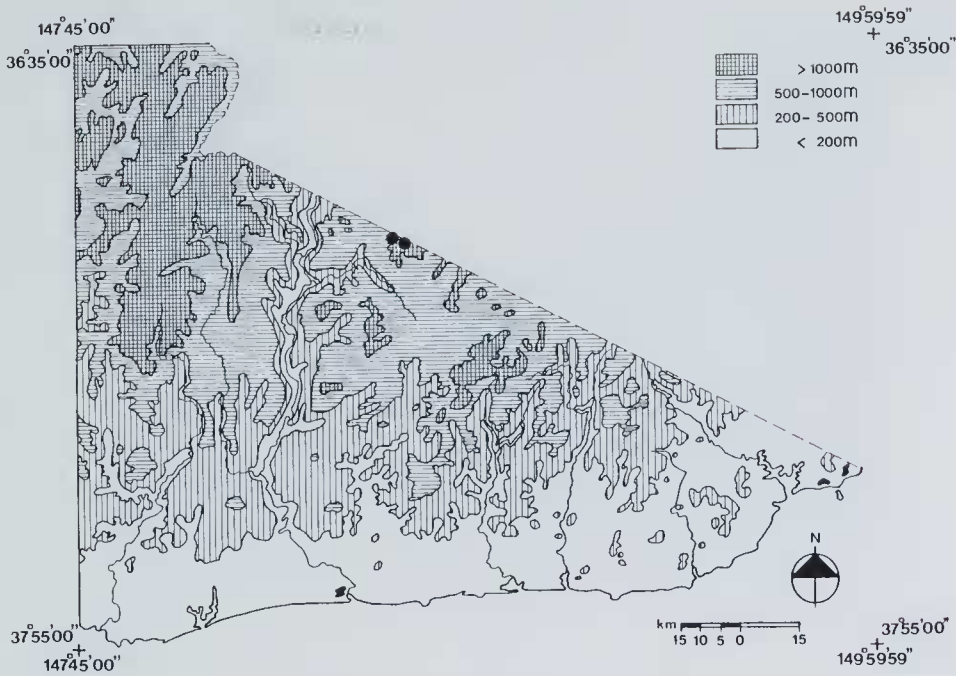
ALTITUDE: Mean = 989 m, Highest = 1160 m, Lowest = 900 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 38 species per site

MEAN WEED COMPOSITION: 7% of species, 4% of cover

NOTES: Although *Eucalyptus pauciflora* and *E. rubida* are typical highland species the understory is comprised of foothill and lowland species. This sub-community has the lowest mean altitude of this community and affinities with community 9 are apparent. Opportunistic members of the Papilionaceae (*Pultenaea juniperina* and *Daviesia ulicifolia*) are prominent in the understory. The complement of these two species cover values is generally high, implying disturbance by fire. The presence of two introduced species, *Centaurium pulchellum* and *Hypochoeris radicata* is a further indication of disturbance. Community 5 is the only sub-community with *Themeda australis* as a character species.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Acacia obliquinervia</i>	100	1	<i>Eucalyptus pauciflora</i>	100	1	<i>Poa australis</i> spp. agg.	100	1
<i>Daviesia mimosoides</i>	100	1	<i>Grevillea victoriae</i>	100	2	<i>Stellaria pungens</i>	100	1
<i>Dianella tasmanica</i>	100	1	<i>Luzula campestris</i> spp. agg.	100	+	<i>Veronica perfoliata</i>	100	1
<i>Eucalyptus glaucescens</i>	100	1	<i>Phebalium ozothamnoides</i>	100	2			

NO. OF SITES: 2 (0.3% of total)

DISTRIBUTION: Mt. Tingaringy.

ENVIRONMENT: Rocky north-facing slopes with skeletal soils

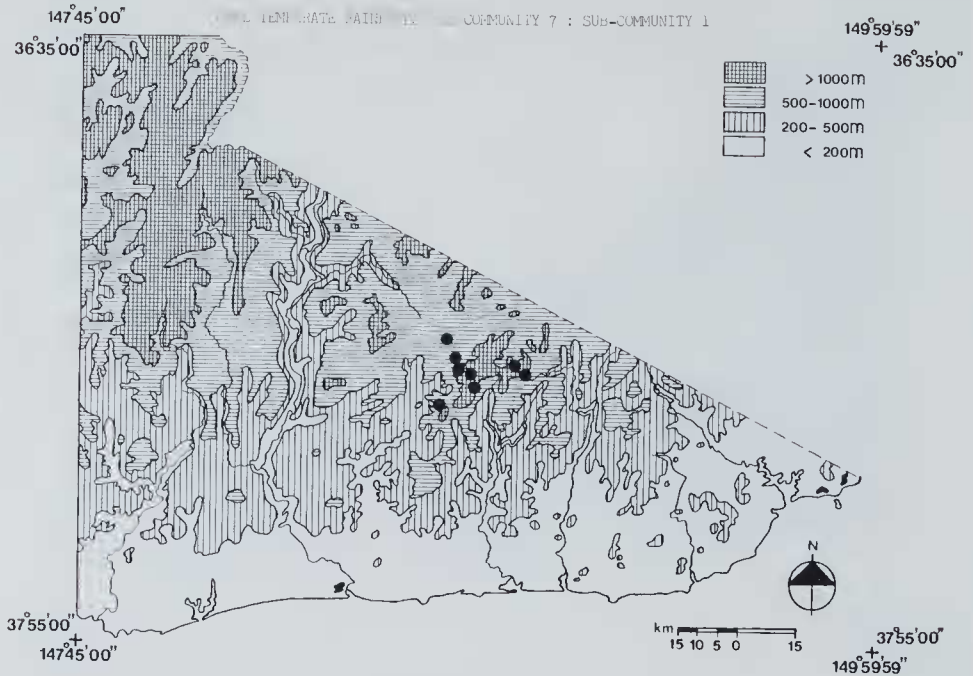
ALTITUDE: Mean = 1429 m, Highest = 1448 m, Lowest = 1410 m.

STRUCTURE: Tall shrubland to Closed-scrub

MEAN FLORISTIC RICHNESS: 25 species per site

MEAN WEED COMPOSITION: 3% of species, 1% of cover

NOTES: The eucalypts in this "community" generally have a mallee habit, forming a tall shrubland above a closed-scrub of *Grevillea victoriae* and *Phebalium ozothamnoides*. Many of the character species are only characteristic of this community within the study area (e.g. *Daviesia mimosoides*, *P. ozothamnoides*, *Eucalyptus glaucescens*), and a number of significant species are peculiar to this area. *E. glaucescens* (Tingaringy gum) has gained its common name from the mountain on which this community is found.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Atherosperma moschatum</i>	100	2	<i>Uncinia tenella</i>	88	1	<i>Asplenium bulbiferum</i>	75	1
<i>Blechnum fluviatile</i>	100	+	<i>Dicksonia antarctica</i>	88	4	<i>Clematis aristata</i>	75	1
<i>Blechnum wattsi</i>	100	1	<i>Histiopteris incisa</i>	88	+	<i>Fieldia australis</i>	75	1
<i>Elaeocarpus holopetalus</i>	100	2	<i>Pittosporum bicolor</i>	88	1	<i>Viola hederacea</i>	75	+
<i>Grammitis billardieri</i>	100	1	<i>Polyphlebium venosum</i>	88	1	<i>Prostanthera lasianthos</i>	63	+
<i>Telopea oreades</i>	100	1	<i>Acacia dealbata</i>	75	1	<i>Acacia frigescens</i>	63	2
<i>Eucalyptus nitens</i>	88	1	<i>Tasmannia lanceolata</i>	75	1	<i>Australina muelleri</i>	63	1
<i>Polystichum proliferum</i>	88	1						

NO. OF SITES: 8 (1.4% of total)

DISTRIBUTION: Vicinity of Mt. Ellery, the Goonmirk Range and the Coast Range.

ENVIRONMENT: Sheltered gullies and slopes within a high altitude, high rainfall (approx. 1300 mm per annum) region

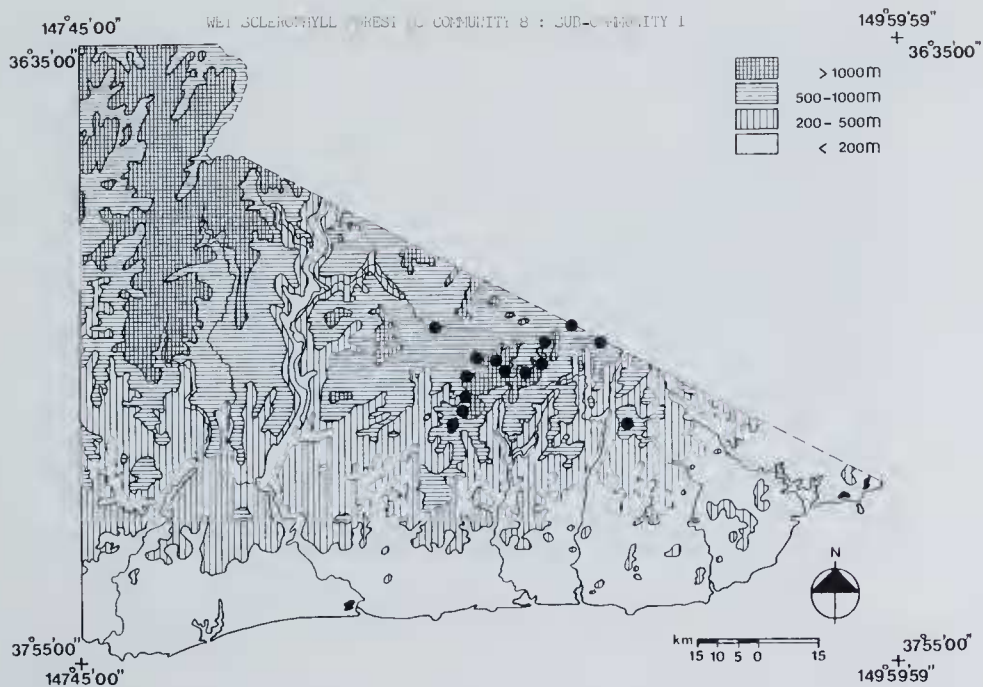
ALTITUDE: Mean = 998 m, Highest = 1200 m, Lowest = 760 m.

STRUCTURE: Closed-forest

MEAN FLORISTIC RICHNESS: 31 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: Cool-temperate closed-forests of the mainland occur only in this region, Strezlecki Ranges, the Central Highlands and the Otway Ranges. The latter three regions support forests dominated by *Nothofagus cunninghamii*, a species absent from East Gippsland. *Atherosperma moschatum*, a tree occurring frequently with *N. cunninghamii*, is the dominant species of sub-community 7.1 and very large trees of *Elaeocarpus holopetalus* form the subsidiary canopy element. Ferns particularly *Dicksonia antarctica* and *Blechnum* spp. dominate the lower strata and several species (*Polyphlebium venosum*, *Asplenium bulbiferum* and *Grammitis billardieri*) are common epiphytes. Extensive bushfires have not occurred within this region since European settlement and until recently access has been very limited. As a result this sub-community comprises some very old examples of this restricted kind of vegetation.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Dicksonia antarctica</i>	94	2	<i>Acacia dealbata</i>	76	1	<i>Pittosporum bicolor</i>	59	1
<i>Histiopteris incisa</i>	94	1	<i>Poa australis</i> spp. agg.	76	1	<i>Olearia phlogopappa</i>	53	1
<i>Polystichum proliferum</i>	94	2	<i>Eucalyptus nitens</i>	65	1	<i>Elaeocarpus holopetalus</i>	53	1
<i>Telopea creades</i>	88	1	<i>Notelaea ligustrina</i>	65	+	<i>Olearia argophylla</i>	53	1
<i>Stellaria flaccida</i>	82	1	<i>Clematis aristata</i>	65	+	<i>Olearia lirata</i>	53	1
<i>Blechnum watsii</i>	82	1	<i>Dianella tasmanica</i>	65	1	<i>Pteridium esculentum</i>	53	+
<i>Tasmania lanceolata</i>	76	1						

NO. OF SITES: 17 (2.9% of total)

DISTRIBUTION: Scattered between Bonang and near Buldah, but most abundant on the Errinundra Plateau and the Coast Range.

ENVIRONMENT: Sheltered sites, either south facing slopes or gullies within high-rainfall highlands

ALTITUDE: Mean = 1022 m, Highest = 1160 m, Lowest = 720 m.

STRUCTURE: Tall open-forest

MEAN FLORISTIC RICHNESS: 28 species per site

MEAN WEED COMPOSITION: 1% of species, 1% of cover

NOTES: This sub-community is transitional between the cool-temperate closed-forest of 7.1 and the tall open-forest of 8.2. *Leucopogon maccraei* and *Persoonia silvatica* are more abundant in this ecotonal forest than any other of the study area. The largest trees of *Eucalyptus nitens* and *E. fastigata* in Victoria occur in this sub-community and are currently being utilised for sawlog production.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Bedfordia arborescens</i>	87	1	<i>Clematis aristata</i>	70	1	<i>Eucalyptus cypellocarpa</i>	57	1
<i>Eucalyptus obliqua</i>	83	1	<i>Polystichum proliferum</i>	67	1	<i>Dicksonia antarctica</i>	53	1
<i>Aisophila australis</i>	83	1	<i>Dianella tasmanica</i>	67	1	<i>Blechnum watsii</i>	53	2
<i>Pteridium esculentum</i>	77	1	<i>Smilax australis</i>	67	1	<i>Tylophora barbata</i>	53	1
<i>Coprocna quadrifida</i>	77	1	<i>Tetarrhena juncea</i>	67	1	<i>Geranium potentilloides</i>	50	1
<i>Pomaderris aspera</i>	77	1	<i>Stellaria flaccida</i>	63	1	<i>Poa australis</i> spp. agg.	50	1
<i>Olearia argophylla</i>	77	1	<i>Olearia lirata</i>	60	1	<i>Acacia dealbata</i>	47	1
<i>Viola hederacea</i>	70	+						

NO. OF SITES: 26 (4.4% of total)

DISTRIBUTION: Widespread throughout montane areas between Mt. Coopracambra, Mt. Delegate and the Nunniong Plateau.

ENVIRONMENT: Cool, wet slopes, generally of southerly aspect. Also gullies bounded by drier forest types

ALTITUDE: Mean = 717 m, Highest = 1020 m, Lowest = 540 m.

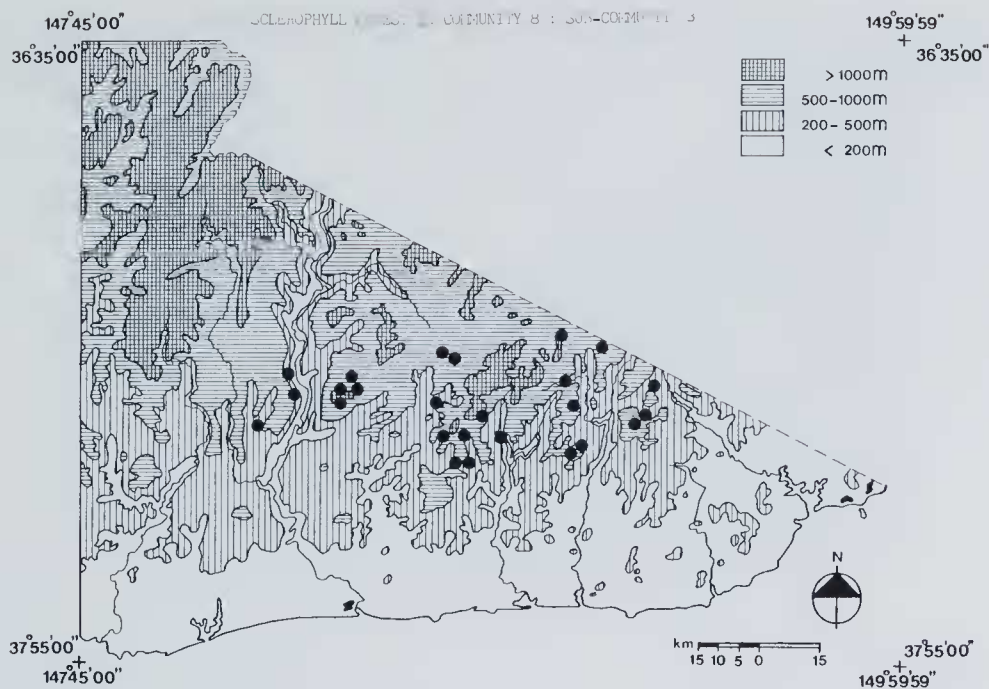
STRUCTURE: Tall open-forest

MEAN FLORISTIC RICHNESS: 36 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: This sub-community is floristically and structurally comparable to montane tall open-forests elsewhere in Victoria. However, East Gippsland endemics such as *Eucalyptus fastigata*, *Smilax australis* and *Tylophora barbata* are lacking from the latter. *Dicksonia antarctica* ubiquitous throughout the more sheltered sub-communities 7.1 and 8.1, is less common in 8.2 than is *Aisophila australis* (another tree fern). Other ferns, particularly *Blechnum* spp. are absent and epiphytic species are rare in this sub-community.





CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Clematis aristata</i>	100	+	<i>Helichrysum bracteatum</i>	80	+	<i>Acaena anserinifolia</i>	60	+
<i>Cotula filicula</i>	100	+	<i>Leucopogon suaveolens</i>	80	1	<i>Bedfordia arborescens</i>	60	2
<i>Dianella tasmanica</i>	100	1	<i>Luzula campestris</i> spp. agg.	80	+	<i>Cassinia aculeata</i>	60	+
<i>Eucalyptus radiata</i>	100	1	<i>Olearia argophylla</i>	80	+	<i>Coprosma quadrifida</i>	60	1
<i>Hydrocotyle hirta</i>	100	+	<i>Olearia phlogopappa</i>	80	1	<i>Alsophila australis</i>	60	+
<i>Stellaria flaccida</i>	100	+	<i>Pteridium esculentum</i>	80	1	<i>Dicksonia antarctica</i>	60	1
<i>Viola hederacea</i>	100	1	<i>Acacia mucronata</i>	60	1	<i>Eucalyptus cypellocarpa</i>	60	1
<i>Lagenifera stipitata</i>	80	1	<i>Daviesia ulicifolia</i>	60	1	* <i>Hypochoeris radicata</i>	60	+
<i>Poa australis</i> spp. agg.	80	1	<i>Helichrysum scorpioides</i>	60	+	<i>Olearia lirata</i>	60	1
<i>Acacia melanoxylon</i>	80	1	<i>Lomandra longifolia</i>	60	1	<i>Polystichum proliferum</i>	60	1
<i>Eucalyptus obliqua</i>	80	1	<i>Poranthera microphylla</i>	60	+	<i>Senecio linearifolius</i>	60	1
<i>Geranium potentilloides</i>	80	1	<i>Pultenaea juniperina</i>	60	2	<i>Veronica calycina</i>	60	+
<i>Gonocarpus tetragynus</i>	80	1						

NO. OF SITES: 4 (0.7% of total)

DISTRIBUTION: Localised to the north of the Errinundra Plateau between Bonang and Bendock.

ENVIRONMENT: Broad open gullies usually containing minor watercourses

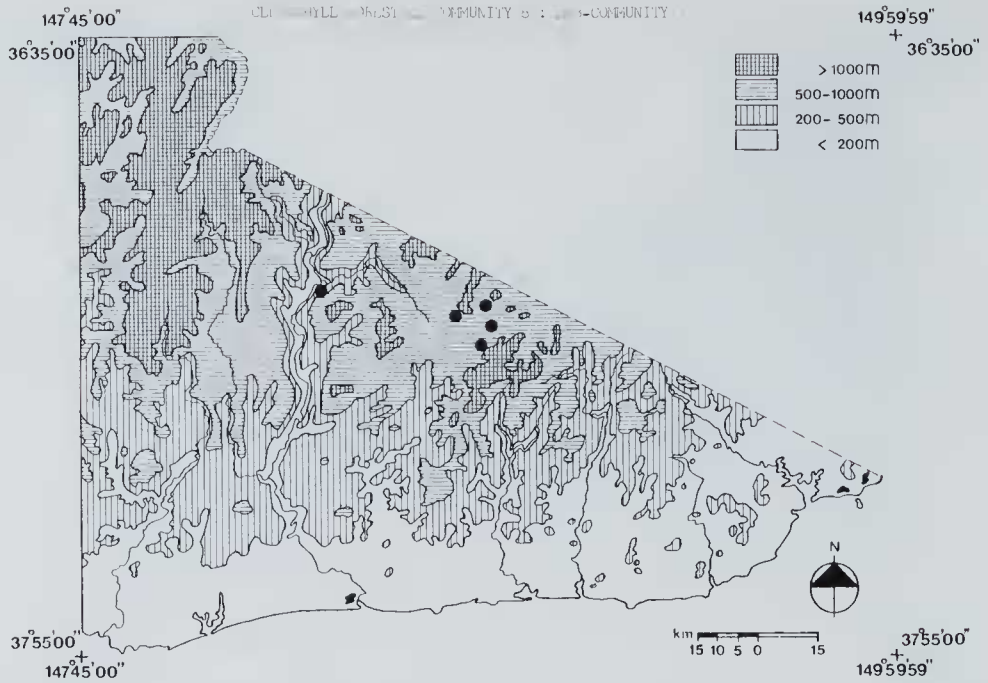
ALTITUDE: Mean = 955 m, Highest = 1000 m, Lowest = 930 m.

STRUCTURE: Tall open-forest

MEAN FLORISTIC RICHNESS: 50 species per site

MEAN WEED COMPOSITION: 3% of species, 2% of cover

NOTES: This sub-community shares floristic affinities with lower-altitude forests. The absence of many species characteristic of the wetter sub-communities 7.1, 8.1, 8.2 and the presence of such species as *Pultenaea juniperina*, *Acacia mucronata* and *Daviesia ulicifolia* indicate 8.3 is a drier forest. An abundance of the latter species is indicative of vegetation which has been previously burnt. Several other character species of this sub-community are indicative of disturbance.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Aucuba dealbata</i>	100	1	<i>Eucalyptus radiata</i>	80	2	<i>Dicksonia antarctica</i>	60	1
<i>Dianella tasmanica</i>	100	1	<i>Leucopogon suaveolens</i>	80	1	<i>Tasmannia lanceolata</i>	60	3
<i>Eucalyptus viminalis</i>	100	1	<i>Luzula campestris</i> spp. agg.	80	+	<i>Dryophila cyanocarpa</i>	60	+
<i>Geranium potentilloide.</i>	100	+	<i>Stellaria flaccida</i>	80	1	<i>Gahnia sieberana</i>	60	1
<i>Pea australis</i> spp. aff.	100	1	<i>Coprosma quadrifida</i>	60	1	<i>Helichrysum scorpioides</i>	60	+
<i>Lagenifera stipitata</i>	80	+	<i>Gonocarpus tetragynus</i>	60	+	<i>Lomandra longifolia</i>	60	+
<i>Polycia bambucifolia</i>	80	1	<i>Helichrysum bracteatum</i>	60	+	<i>Persoonia silvatica</i>	60	1
<i>Aucuba melanoxylon</i>	80	1	<i>Stellaria pungens</i>	60	+	<i>Polystichum proliferum</i>	60	1
<i>Acaemium asperifolium</i>	80	+	<i>Blechnum nudum</i>	60	1	<i>Pteridium esculentum</i>	60	1
<i>Clematis aristata</i>	80	+	<i>Carex appressa</i>	60	1	<i>Viola hederacea</i>	60	+
<i>Lotula fillicula</i>	80	+						

NO. OF SITES: 5 (0.8% of total)

DISTRIBUTION: Confined to the Errinundra Plateau, Bonang area and slopes near the Snowy and Rodger Rivers.

ENVIRONMENT: Near permanent, high-altitude waterways which drain forests such as sub-communities 8.1, 8.2 and 8.3

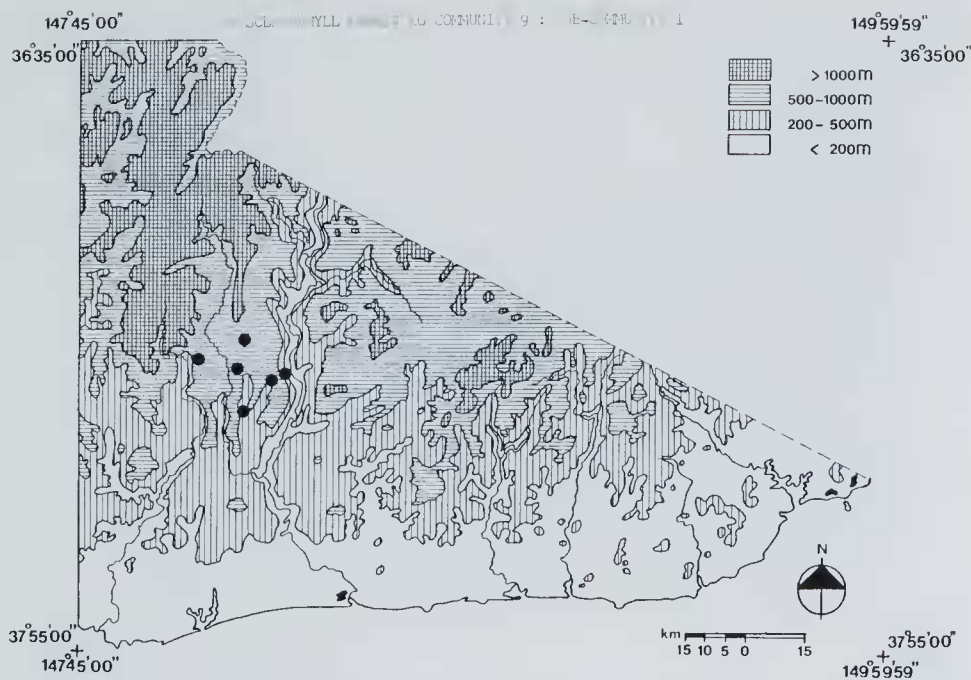
ALTITUDE: Mean = 924 m, Highest = 960 m, Lowest = 880 m.

STRUCTURE: Tall open-forest

MEAN FLORISTIC RICHNESS: 41 species per site

MEAN VEGETATION COMPOSITION: 7% of species, 1% of cover

NOTES: *Eucalyptus viminalis*, usually a slender tree of riversides, in this sub-community dominates a more extensive forest. Particularly large specimens occur in this vegetation up to 60 m with unusual buttressed bases (to 2.5 m diameter). *Leucopogon suaveolens*, a common, low shrub of alpine woodlands and heathlands is common in this sub-community as a tall (up to 2 m) erect shrub.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Eucalyptus sieberi</i>	100	<	<i>Dianella caerulea</i>	83	+	<i>Pteridium esculentum</i>	67	1
<i>Veronica calycina</i>	100	+	<i>Lomandra longifolia</i>	83	1	<i>Cassinia longifolia</i>	67	1
<i>Dianella tasmanica</i>	83	1	<i>Viola hederacea</i>	83	1	<i>Hypericum gramineum</i>	67	+
<i>Eucalyptus globoidea</i>	83	1	<i>Clematis glycinoides</i>	67	+	<i>Lepidosperma laterale</i>	67	1
<i>Poa australis</i> spp. agg.	83	1	<i>Gonocarpus teucroides</i>	67	1	<i>Oxalis corniculata</i>	67	+
<i>Pultenaea juniperina</i>	83	2	<i>Coprosma quadrifida</i>	67	1	<i>Wahlenbergia quadrifida</i>	67	+
<i>Acacia dealbata</i>	83	1						

NO. OF SITES: 6 (1.4% of total)

DISTRIBUTION: Upper Snowy and Timbarra River catchments.

ENVIRONMENT: Ridges on foothills, often rocky, soils siliceous sands or clay

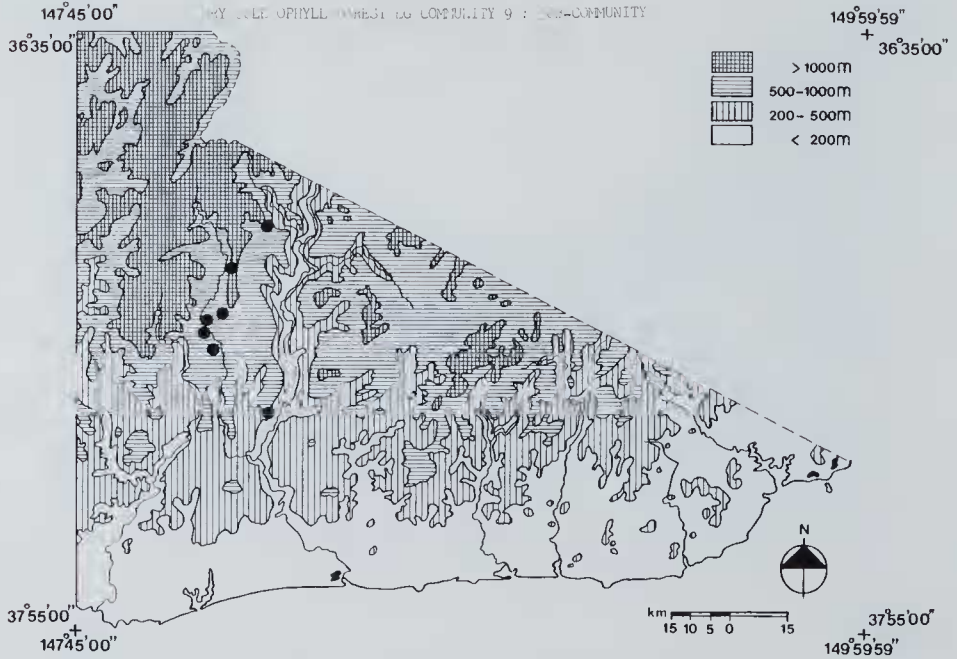
ALTITUDE: Mean = 633 m, Highest = 800 m, Lowest = 540 m.

STRUCTURE: Open-forest to Woodland

MEAN FLORISTIC RICHNESS: 33 species per site

MEAN WEED COMPOSITION: 2% of species, 1% of cover

NOTES: *Eucalyptus sieberi* and *E. globoidea* grow with a quite different suite of species in the foothills compared to the lowlands. The shrub layer is mostly made up of opportunistic species such as *Pultenaea juniperina*, *Cassinia longifolia* and *Acacia dealbata*, whilst the ground layer consists of a sparse cover of herbs. Although *Dianella tasmanica* is usually associated with wet environments, it grows in this dry environment as a rupestral plant, and in this situation effective rainfall may be relatively high.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Cassinia longifolia</i>	100	1	<i>Dichelachne micrantha</i>	88	+	<i>Astroloma humifusum</i>	75	1
<i>Gonocarpus tetragynus</i>	100	1	<i>Hibbertia obtusifolia</i>	88	1	<i>Helichrysum scorpioides</i>	63	1
<i>Lomandra longifolia</i>	100	1	<i>Dianella tasmanica</i>	75	+	<i>Danthonia pallida</i>	63	1
<i>Poa australis</i> spp. agg.	100	1	<i>Epacris impressa</i>	75	1	<i>Hardenbergia violacea</i>	63	+
<i>Acrotriche serrulata</i>	88	1	<i>Acacia dealbata</i>	75	1	<i>Hypericum gramineum</i>	63	1
<i>Pultenaea juniperina</i>	88	2	<i>Tetratheca bauerifolia</i>	75	1	<i>Indigofera australis</i>	63	1

NO. OF SITES: 8 (1.4% of total)

DISTRIBUTION: Upper Snowy and Timbarra River catchments.

ENVIRONMENT: Ridges and slopes of northerly aspect, on well drained heavy soils

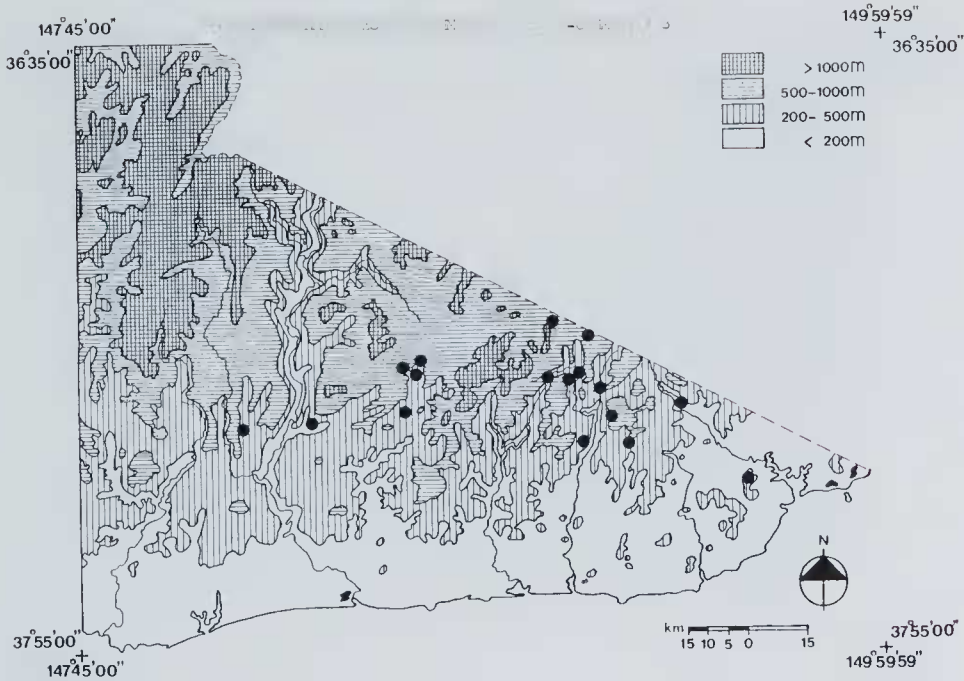
ALTITUDE: Mean = 727 m, Highest = 980 m, Lowest = 600 m.

STRUCTURE: Open-forest to Woodland

MEAN FLORISTIC RICHNESS: 38 species per site

MEAN WEED COMPOSITION: 2% of species, 2% of cover

NOTES: Although no eucalypt is characteristic, one or a number of species including *Eucalyptus cyphellocarpa*, *E. dives*, *E. globulus*, *E. globocida*, *E. sieberi* and *E. macrorhyncha* are present. *E. globulus*, a species often associated with mesic environments, occurs in quite xeric situations on ridges leading down to the Snowy River. *Cassinia longifolia* and leguminous species (*Indigofera australis*, *Pultenaea juniperina* and *Acacia dealbata*) provide a sparse shrub layer over a ground layer of herbs and semi-shrubs common on dry slopes. The three characteristic species of Epacridaceae provide a nectar resource. *Epacris impressa*, flowering through winter and spring is bird pollinated, whilst *Astroloma humifusum* (autumn-winter) and *Acrotriche serrulata* (spring) are pollinated by insects.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Lomandra longifolia</i>	94	1	<i>Danthonia pallida</i>	76	1	<i>Dichelachne micrantha</i>	65	+
<i>Poa australis</i> spp. agg.	94	1	<i>Dianella revoluta</i>	76	1	<i>Epacris impressa</i>	65	1
<i>Dianella caerulea</i>	88	1	<i>Astroloma humifusum</i>	71	1	<i>Oxalis corniculata</i>	53	+
<i>Leucopogon lanceolatus</i>	88	1	<i>Acrotriche serrulata</i>	71	1	<i>Hydrocotyle hirta</i>	53	+
<i>Hypericum gramineum</i>	88	+	<i>Acacia mucronata</i>	65	1	<i>Microlaena stipoides</i>	53	+
<i>Pteridium esculentum</i>	82	1	<i>Conocarpus tetragynus</i>	65	1	<i>Eucalyptus cypellocarpa</i>	53	1
<i>Eucalyptus globoidea</i>	76	2	<i>Hibbertia obtusifolia</i>	65	1	<i>Exocarpos strictus</i>	53	+
<i>Helichrysum scorpioides</i>	76	+	<i>Lepidosperma laterale</i>	65	1	<i>Persoonia linearis</i>	53	1

NO. OF SITES: 17 (2.9% of total)

DISTRIBUTION: Scattered through foothills of entire study area.

ENVIRONMENT: Clays on slopes and ridges

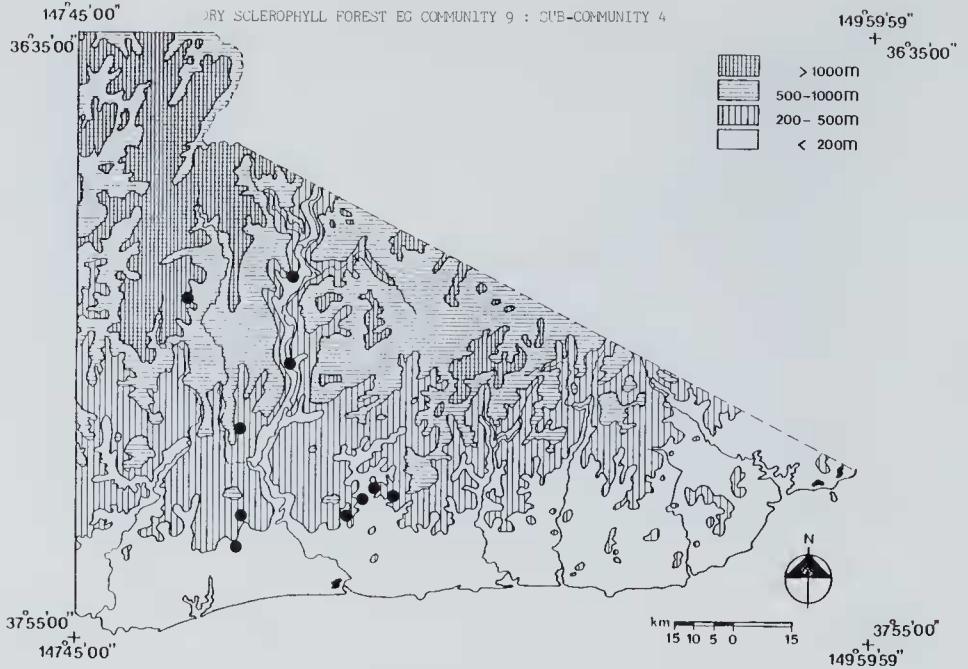
ALTITUDE: Mean = 373 m, Highest = 640 m, Lowest = 170 m.

STRUCTURE: Open-forest to Woodland

MEAN FLORISTIC RICHNESS: 46 species per site

MEAN WEED COMPOSITION: 1% of species, 1% of cover

NOTES: In contrast to other sub-communities of this community, a few shrubs other than the opportunistic species are significant. These include *Leucopogon lanceolatus*, *Persoonia linearis* and *Exocarpos strictus*. The ground layer consists of semi-shrubs and herbs common on dry slopes.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Eucalyptus globoidea</i>	100	1	<i>Gonocarpus teucrioides</i>	78	1	<i>Epacris impressa</i>	56	+
<i>Poa australis</i> spp. agg.	100	1	<i>Lomandra longifolia</i>	78	1	<i>Lepidosperma laterale</i>	56	+
<i>Viola hederacea</i>	89	+	<i>Pteridium esculentum</i>	78	1	<i>Clematis aristata</i>	56	+
<i>Cassinia longifolia</i>	89	1	<i>Eucalyptus cypellocarpa</i>	67	1	<i>Eucalyptus sieberi</i>	56	1
<i>Dianella caerulea</i>	89	+	<i>Persoonia linearis</i>	67	1	<i>Tetrarrhena juncea</i>	56	2

NO. OF SITES: 9 (1.5% of total)

DISTRIBUTION: Buchan, Buldah and Nungatta districts.

ENVIRONMENT: Siliceous sands on ridges and slopes of foothills

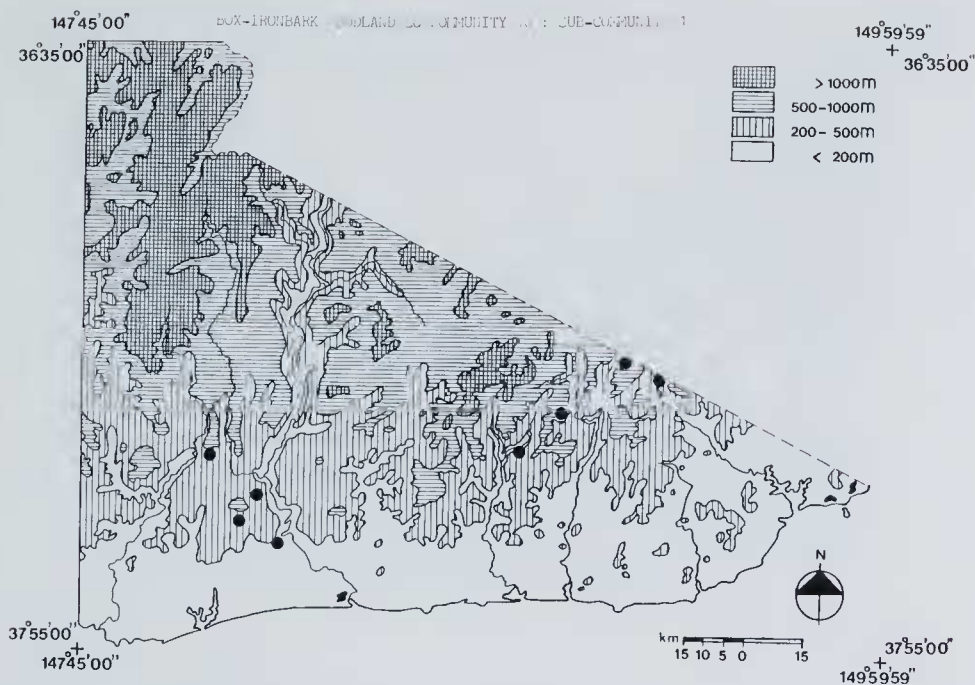
ALTITUDE: Mean = 351 m, Highest = 600 m, Lowest = 180 m.

STRUCTURE: Open-forest to Woodland

MEAN FLORISTIC RICHNESS: 40 species per site

MEAN WEED COMPOSITION: 1% of species, 1% of cover

NOTES: The characteristic species of this sub-community are widespread through eastern Victoria. An absence of dry slope semi-shrubs makes this sub-community structurally unusual amongst the foothill vegetation types. Although *Clematis aristata*, a characteristic species of this dry environment is usually a climber of wet environments, it's wind-borne, plumose seeds disperse it widely. The seedlings usually don't persist for more than a few years on dry slopes.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Cassinia longifolia</i>	100	1	<i>Eucalyptus sideroxylon</i>	70	1	<i>Wahlenbergia quadrifida</i>	60	+
<i>Poa australis</i> spp. agg.	100	1	<i>Eucalyptus globoidea</i>	70	1	<i>Acacia mearnsii</i>	60	1
<i>Acacia falciformis</i>	90	1	<i>Oxalis corniculata</i>	70	+	<i>Correa reflexa</i>	60	1
<i>Exocarpos cupressiformis</i>	90	1	<i>Lomandra longifolia</i>	70	+	<i>Microlaena stipoides</i>	60	1
<i>Lepidosperma laterale</i>	90	+	<i>Billardiera scandens</i>	60	+	<i>Notelaea venosa</i>	60	1
<i>Eucalyptus polyanthemus</i>	80	1	<i>Hibbertia obtusifolia</i>	60	+			

NO. OF SITES: 10 (1.7% of total)

DISTRIBUTION: Scattered in the Snowy and Timbarra River catchments.

ENVIRONMENT: Skeletal soils on dry, often north facing ridges and slopes.

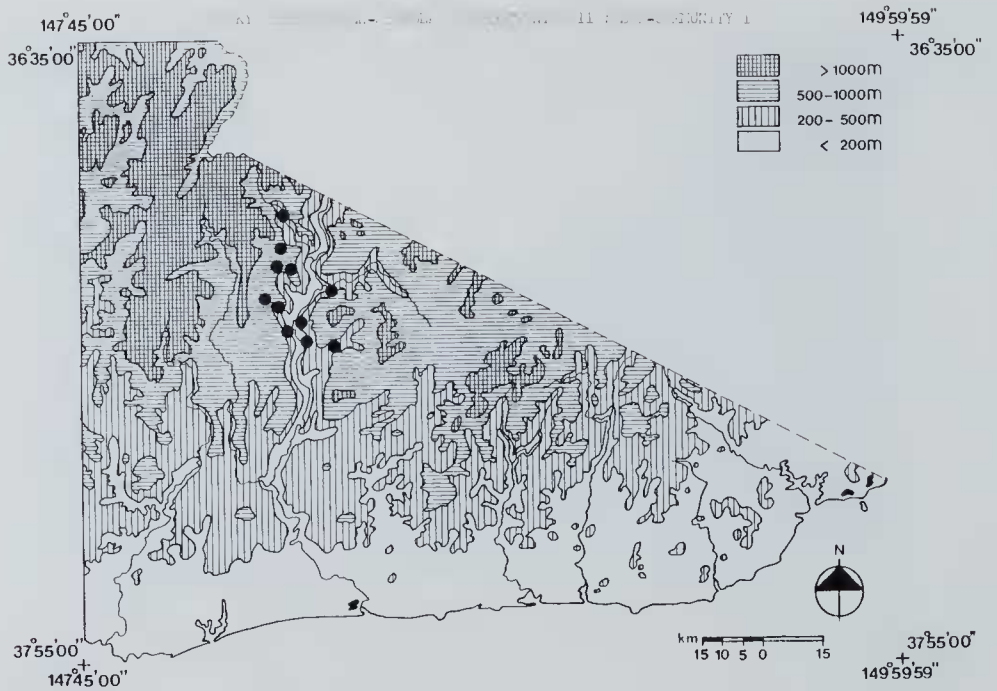
ALTITUDE: Mean = 239 m, Highest = 400 m, Lowest = 100 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 48 species per site

MEAN WEED COMPOSITION: 1% of species, 0% of cover

NOTES: Other than the small trees *Acacia falciformis* and *Notelaea venosa*, the character species of this sub-community are widespread through Victorian foothills. *Eucalyptus polyanthemus* and *E. sideroxylon* are common on dry slopes in Central Victoria but are only occasional in East Gippsland. The ground layer consists of shrubs and herbs common on dry slopes. A surprising character species is *Notelaea venosa*, which shows optimal development in Victoria in warm temperate rainforest.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Platysace lanceolata</i>	91	1	<i>Brachyloma daphnoides</i>	64	1	<i>Cassinia longifolia</i>	55	+
<i>Dianella revoluta</i>	73	1	<i>Olearia iodochroa</i>	64	1	<i>Eucalyptus macrorrhyncha</i>	55	1
<i>Eriostemon trachyphyllus</i>	73	1	<i>Tieghemopanax multifidus</i>	64	+	<i>Eucalyptus sieberi</i>	55	2
<i>Exocarpos cupressiformis</i>	73	1	<i>Acacia silvestris</i>	55	1	<i>Persoonia confertiflora</i>	55	1
<i>Helichrysum obtusatum</i>	73	1	<i>Eucalyptus smithii</i>	55	1	<i>Danthonia pallida</i>	55	1
<i>Danthonia longifolia</i>	64	1						

NO. OF SITES: 11 (1.9% of total)

DISTRIBUTION: Confined to upper Snowy River district.

ENVIRONMENT: Rocky escarpments and exposed slopes with skeletal soils

ALTITUDE: Mean = 740 m, Highest = 900 m, Lowest = 600 m.

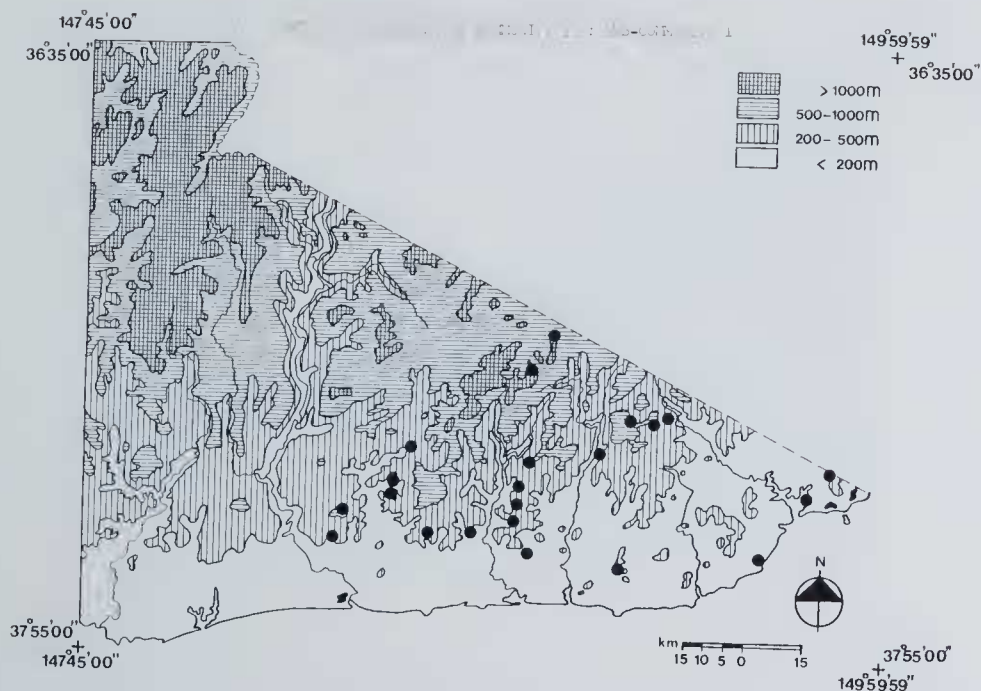
STRUCTURE: Tall shrubland to Closed-scrub

MEAN FLORISTIC RICHNESS: 32 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTE: Thickets without eucalypts may be characterised by *Eriostemon trachyphyllus* (locally "blackthorn scrub") or *Acacia silvestris*. In areas where this cover is unbroken, the number of species at a site may be as low as 8. Where eucalypts are present mallee, or low-branching, spindly forms of *Eucalyptus saxatilis*, *E. smithii*, *E. viminalis* and *E. glaucescens* predominate. *E. smithii* in this sub-community is generally that referred to by Kirkpatrick (1977) as *E. aff. smithii*. Cover may vary from very low values for all strata to being complete in the shrub layer. This sub-community is often found on rock crags with spectacular views. Significant species include *Haloragodesdron bauerlenii*, *Phebalium lamprophyllum*, *Acrotriche divaricata*, *Boronia ledifolia*, *Dampiera purpurea*, *Guhnia microstachya* and *Goodenia heterophylla* and are almost restricted to this community. Its inhospitable environment and lack of commercial value has precluded exploitation.





CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Coprosma quadrifida</i>	100	1	<i>Tetrarrhena juncea</i>	78	1	<i>Eucalyptus cypellocarpa</i>	61	1
<i>Eugenia smithii</i>	100	2	<i>Notelaea venosa</i>	74	+	<i>Clematis aristata</i>	61	1
<i>Blechnum cartilagineum</i>	91	1	<i>Bedfordia arborescens</i>	74	1	<i>Rubus rosifolius</i>	61	+
<i>Eustrephus latifolius</i>	91	1	<i>Olearia argophylla</i>	74	1	<i>Scirpus inundatus</i>	61	1
<i>Smilax australis</i>	91	1	<i>Blechnum nudum</i>	74	1	<i>Sigesbeckia orientalis</i>	57	+
<i>Alsophila australis</i>	87	2	<i>Ceranium potentilloides</i>	70	+	<i>Microsorium scandens</i>	57	1
<i>Marsdenia rostrata</i>	87	1	<i>Elaeocarpus reticulatus</i>	70	1	<i>Morinda jasminoides</i>	57	1
<i>Pomaderris aspera</i>	87	1	<i>Blechnum patersonii</i>	70	1	<i>Parsonia brownii</i>	57	1
<i>Cissus hypoglauca</i>	83	1	<i>Gahnia melanocarpa</i>	70	+	<i>Polyphlebium venosum</i>	57	1
<i>Fieldia australis</i>	83	1	<i>Tylophora barbata</i>	65	1	<i>Prostanthera lasianthos</i>	57	1
<i>Viola hederacea</i>	83	+	<i>Acacia melanoxylon</i>	65	1	<i>Blechnum watsii</i>	52	1
<i>Dicksonia antarctica</i>	83	1	<i>Clematis glycinoides</i>	65	1	<i>Culcita dubia</i>	52	1
<i>Pandorea pandorana</i>	83	1	<i>Polystichum proliferum</i>	65	1	<i>Eucalyptus obliqua</i>	52	1
<i>Lastreopsis acuminata</i>	78	1	<i>Rubus hillii</i>	61	+	<i>Tristania laurina</i>	52	1

NO. OF SITES: 23 (3.9% of total)

DISTRIBUTION: Of restricted distribution west of the Snowy River but more common in the lowlands east to the Howe Range.

ENVIRONMENT: Sheltered gullies and alluvial flats associated with most river systems and their tributaries. Rich humic soils and rocky outcrops are common features

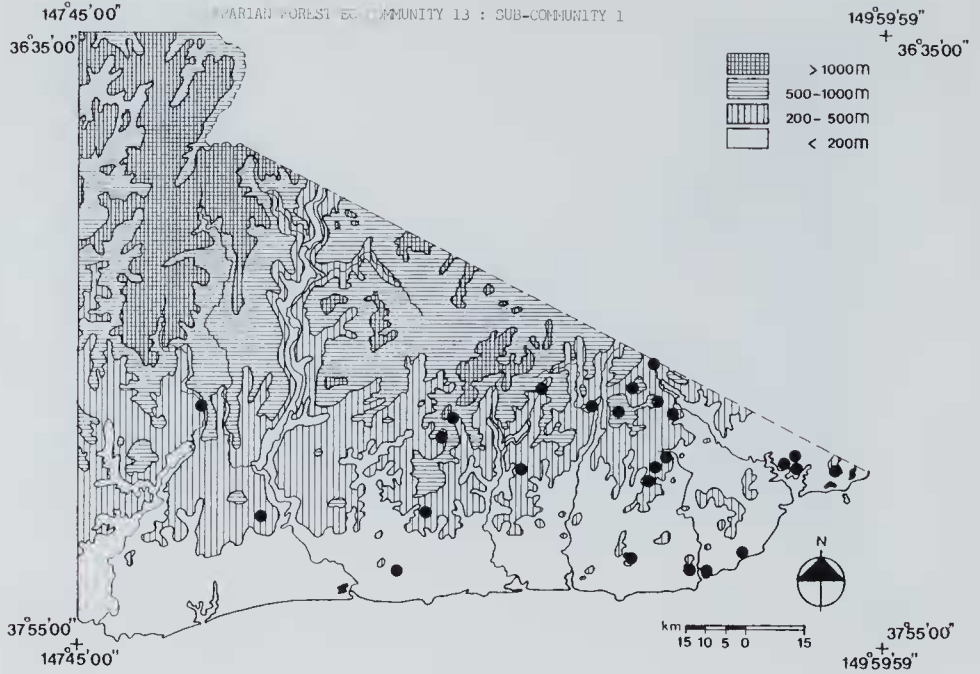
ALTITUDE: Mean = 234 m, Highest = 480 m, Lowest = 40 m.

STRUCTURE: Closed-forest

MEAN FLORISTIC RICHNESS: 58 species per site

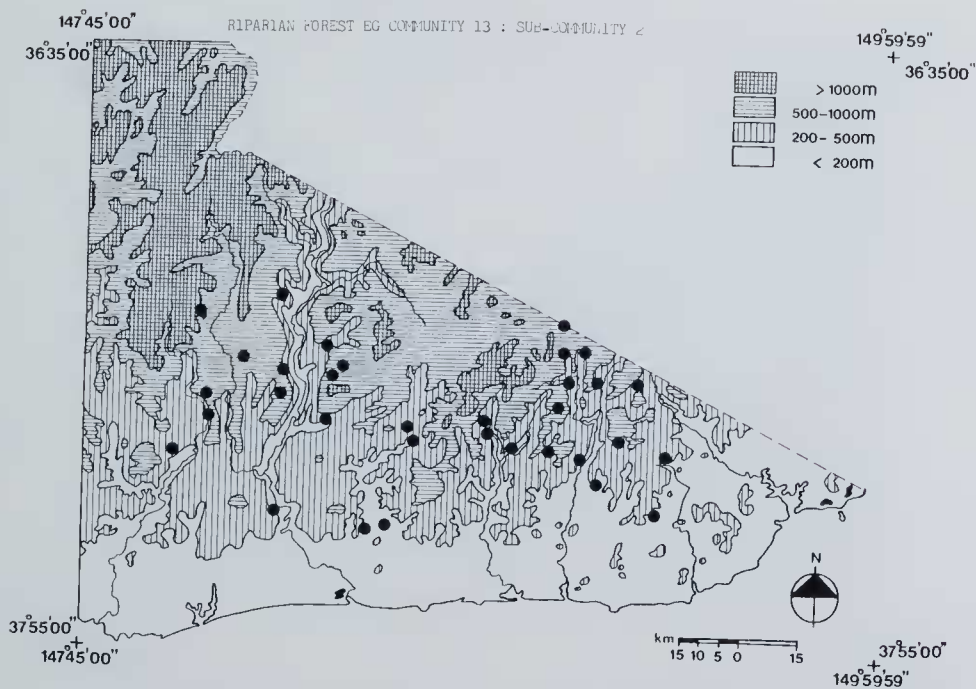
MEAN WEED COMPOSITION: 2% of species, 1% of cover

NOTES: This sub-community forms one of few Victorian forest types not dominated by eucalypts. *Eugenia smithii* dominates the forest forming a conspicuous dark green closed canopy usually tangled with lianes (e.g. *Cissus hypoglauca*, *Marsdenia rostrata*, *Smilax australis*). Ferns are prominent beneath the canopy including arborescent forms (any of Victoria's 5 tree ferns), ground-ferns (*Blechnum watsii*, *B. cartilagineum*, *Lastreopsis acuminatum*) and epiphytes (*Microsorium scandens*, *M. diversifolium*, *Polyphlebium venosum*). These forests are near the southern limit of a vegetation-type common and extensive within tropical regions. A feature of the tropical rainforests however is a high species diversity within the tallest stratum, often more than 100 species per acre (Specht, 1970) (c.f. rarely more than 2 or 3 species of tree per site in 12.1).



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Tetrarrhena juncea</i>	86	1	<i>Smilax australis</i>	68	1	<i>Poa australis</i> spp. agg.	57	1
<i>Pteridium esculentum</i>	82	1	<i>Elaeocarpus reticulatus</i>	64	1	<i>Pomaderris aspera</i>	54	1
<i>Clematis aristata</i>	75	1	<i>Goodenia ovata</i>	64	1	<i>Leucopogon lanceolatus</i>	54	1
<i>Eustrephus latifolius</i>	71	+	<i>Coprosma quadrifida</i>	61	1	<i>Eucalyptus obliqua</i>	50	2
<i>Tylophora barbata</i>	71	1	<i>Blechnum cartilagineum</i>	61	1	<i>Culcita dubia</i>	46	1
<i>Eucalyptus cypellocarpa</i>	71	1	<i>Alsophila australis</i>	61	1	<i>Dianella caerulea</i>	46	1
<i>Viola hederacea</i>	71	+	<i>Gonocarpus teucrioides</i>	57	1	<i>Eucalyptus muelleriana</i>	46	1

- NO. OF SITES: 26 (4.4% of total)
- DISTRIBUTION: Rare west of the Snowy River but frequent in the lowlands and foothills east to the Howe Range.
- ENVIRONMENT: Wet, south-facing slopes and gullies of lowland and foothills
- ALTITUDE: Mean = 298 m, Highest = 480 m, Lowest 40 m.
- STRUCTURE: Open-forest
- MEAN FLORISTIC RICHNESS: 48 species per site
- MEAN WEED COMPOSITION: 0% of species, 0% of cover
- NOTES: This sub-community has strong floristic affinities with 12.1 and the lowland wet-sclerophyll forests (13.2). In certain this represents a true ecotone between two vegetation types, but in areas which are occasionally burnt (particularly the lowlands), a "temporal ecotone" may exist in which the vegetation is in a successional state from sclerophyll-forest to *Eugenia smithii* closed-forest.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Pomaderris aspera</i>	85	1	<i>Geranium potentilloides</i>	68	+	<i>Juncus plantifolius</i>	53	+
<i>Coprosma quadrifida</i>	79	1	<i>Clematis aristata</i>	68	+	<i>Acacia dealbata</i>	50	1
<i>Lomandra longifolia</i>	79	1	<i>Gratiola peruviana</i>	68	1	<i>Prunella vulgaris</i>	50	1
<i>Pteridium esculentum</i>	79	1	<i>Graphalium japonicum</i>	68	+	<i>Cassinia longifolia</i>	50	1
<i>Blechnum nudum</i>	79	1	<i>Carex appressa</i>	65	1	<i>Tristania laurina</i>	50	1
<i>Viola hederacea</i>	76	+	<i>Hydrocotyle hirta</i>	62	+	<i>Goodenia ovata</i>	47	1
<i>Oxalis corniculata</i>	76	+	<i>Tetrarrhena juncea</i>	62	1	<i>Senecio linearifolius</i>	47	1
<i>Stellaria flaccida</i>	76	1	<i>Leptospermum phylloides</i>	62	1	<i>Dicksonia antarctica</i>	44	1
<i>Microlaena stipoides</i>	76	1	<i>Pimelea axiflora</i>	59	1	* <i>Cirsium vulgare</i>	44	+
<i>Scirpus inundatus</i>	76	1	<i>Dianella tasmanica</i>	56	1	<i>Blechnum minus</i>	44	1
<i>Acacia melanoxylon</i>	76	1	<i>Cassinia aculeata</i>	56	+	<i>Lepidosperma laterale</i>	44	1
<i>Adiantum aethiopicum</i>	74	1	<i>Bursaria spinosa</i>	56	1	<i>Eucalyptus viminalis</i>	44	1
<i>Poa australis</i> spp. agg.	71	1	<i>Eucalyptus cypellocharpa</i>	53	1	<i>Goodia lotifolia</i>	44	+
<i>Acaena anserinifolia</i>	71	+	<i>Culcita dubia</i>	53	1	<i>Lomatia myricoides</i>	44	1
* <i>Hypochoeris radicata</i>	71	+	<i>Aisophila australis</i>	53	1	<i>Olearia lirata</i>	44	+
<i>Prostanthera lasianthos</i>	68	1	* <i>Rubus fruticosus</i> spp. agg.	53	1			

NO. OF SITES: 33 (5.6% of total)

DISTRIBUTION: Common throughout regions more than 20 km inland but not in the alps, subalps or the rainshadow area of the upper Snowy River.

ENVIRONMENT: Gently falling, mid-altitude waterways. Alluvial soils and granitic sands interspersed with boulders generally comprise the substrate

ALTITUDE: Mean = 292 m, Highest = 700 m, Lowest = 80 m.

STRUCTURE: Open-forest

MEAN FLORISTIC RICHNESS: 67 species per site

MEAN WEED COMPOSITION: 7% of species, 6% of cover

NOTES: High floristic richness is a feature of riparian vegetation and this sub-community has the highest mean number of species per site of any encountered in the study. Soil nutrients are concentrated in river valleys and water availability is rarely a limiting factor to plants of this environment. Seeds of plants, including weeds, are also concentrated near rivers, and moderately high numbers of weeds are not necessarily indicative of disturbance near the sampled site. 13.2 is an example of this process.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Lomandra longifolia</i>	100	1	<i>Poa australis</i> spp. agg.	67	1	<i>Holcus lanatus</i>	60	+
* <i>Hypochoeris radicata</i>	93	1	<i>Prunella vulgaris</i>	67	1	<i>Hypericum japonicum</i>	60	+
* <i>Rubus fruticosus</i> spp. agg.	73	1	<i>Acaena anserinifolia</i>	67	1	<i>Pomaderris aspera</i>	53	1
<i>Acacia melanoxylon</i>	73	1	<i>Carex appressa</i>	67	1	<i>Epilobium cinereum</i>	53	1
* <i>Centaureum pulchellum</i>	73	1	<i>Agrostis avenacea</i>	67	+	* <i>Rosa rubiginosa</i>	53	1
<i>Geranium potentilloides</i>	73	+	<i>Leptospermum phyllicoides</i>	67	1	* <i>Trifolium repens</i>	53	1
<i>Cratiola peruviana</i>	73	1	<i>Lomatia myricoides</i>	60	1	<i>Cyperus lucidus</i>	53	1
<i>Acacia dealbata</i>	67	1	<i>Hydrocotyle sibthorpioides</i>	60	1	<i>Polygonum hydropiper</i>	53	+
<i>Carex gaudichaundiana</i>	67	1	<i>Rumex brownii</i>	60	1	<i>Juncus</i> spp.	53	1
<i>Gnaphalium japonicum</i>	67	1						

NO. OF SITES: 14 (2.6% of total)

DISTRIBUTION: Along the banks of the upper-Snowy and Buchan Rivers with one site beside the Genoa River near Wangarabell.

ENVIRONMENT: Banks of rivers flowing through dry, open-forest areas. Seasonal flooding forms banks of alluvial sands in some areas. Granite or sandstone boulders are common features of these shores

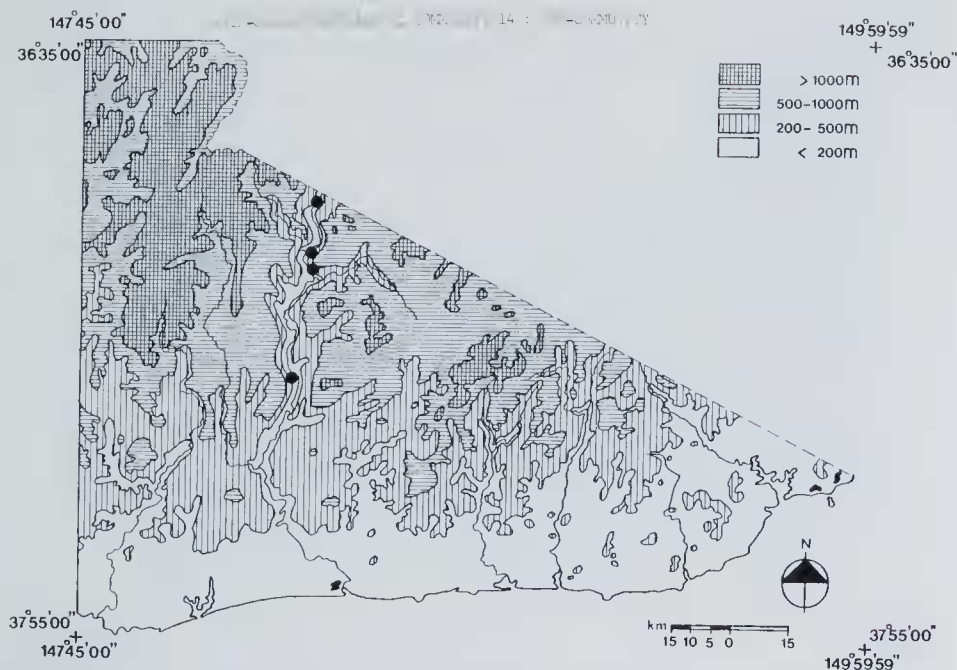
ALTITUDE: Mean = 529 m, Highest = 760 m, Lowest = 160 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 60 species per site

MEAN WEED COMPOSITION: 15% of species, 15% of cover

NOTES: A riparian vegetation-type of drier, more open areas than 13.2. Many areas in the vicinity of this sub-community have been converted to agricultural land and this influence is responsible for the high weed numbers of 13.3.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Acacia boormanii</i>	100	1	<i>Lissanthe strigosa</i>	75	1	* <i>Coryza bonariensis</i>	75	1
* <i>Hypochoeris radicata</i>	100	+	<i>Acacia dealbata</i>	75	1	<i>Eucalyptus blakelyi</i>	75	1
<i>Leptospermum phyllicoides</i>	100	>	<i>Arthropodium milleflorum</i>	75	+	<i>Gnaphalium luteoalbum</i>	75	+
* <i>Verbascum thapsus</i>	100	+	<i>Calytrix tetragona</i>	75	1	* <i>Hirschfeldia incana</i>	75	+
<i>Acacia mearnsii</i>	75	1	<i>Cheilanthes tenuifolia</i>	75	1	* <i>Petrohragia velutina</i>	75	+
<i>Dodonaea viscosa</i>	75	1						

NO. OF SITES: 4 (0.7% of total)

DISTRIBUTION: Restricted to the upper Snowy River, but common from the border downstream to near New Guinea.

ENVIRONMENT: Coarse alluvial sands beside the river. Sites sampled are within the north-eastern rainshadow area (mean annual rainfall less than 800 mm). Flooding of the river is a common occurrence

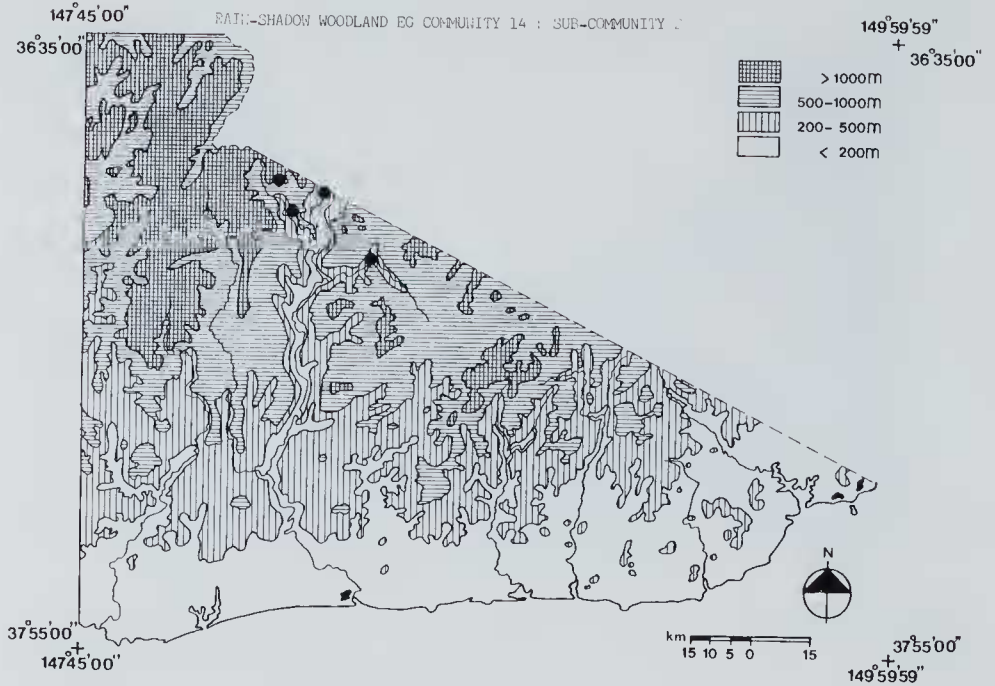
ALTITUDE: Mean = 170 m, Highest = 210 m, Lowest = 100 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 54 species per site

MEAN WEED COMPOSITION: 32% of species, 27% of cover

NOTES: Short-lived species, particularly weeds (*Verbascum thapsus*, *Petrohragia velutina*, *Hirschfeldia incana*), capable of completing their life-cycle between flood periods, are common in this sub-community. Other woody species (*Leptospermum phyllicoides*, *Calytrix tetragona*, *Eucalyptus blakelyi*) are often contorted by successive flooding of the river. Above the flood-prone section of the bank species characteristic of the surrounding woodlands are common.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Agropyron scabrum</i>	100	1	<i>Aristida ramosa</i>	75	1	<i>Hardenbergia violacea</i>	75	+
<i>Cheilanthes tenuifolia</i>	100	1	<i>Cheilanthes distans</i>	75	+	<i>Lissanthe strigosa</i>	75	1
<i>Eucalyptus albens</i>	100	1	<i>Danthonia racemosa</i>	75	1	<i>Melichrus urceolatus</i>	75	1
<i>Poa australis</i> spp. agg.	100	1	<i>Dichanthium sericeum</i>	75	+	<i>Oxalis corniculata</i>	75	+
<i>Clematis microphylla</i>	75	1	<i>Dichelachne crinita</i>	75	+	<i>Stellaria pungens</i>	75	1
<i>Cymbopogon refractus</i>	75	1	<i>Dichondra repens</i>	75	+	<i>Themeda australis</i>	75	2
<i>Lomandra longifolia</i>	75	+	<i>Dodonaea angustissima</i>	75	+	<i>Vittadinia triloba</i>	75	1
<i>Acacia implexa</i>	75	1	<i>Enneapogon nigricans</i>	75	1			

NO. OF SITES: . (0.7% of total)

DISTRIBUTION: Areas surrounding the upper Snowy River and its tributaries; particularly near Willis, Suggan Buggan and Tubbut.

ENVIRONMENT: Dry, often steep slopes (mean annual rainfall less than 700 mm) of gravelly soils with frequent granite outcrops

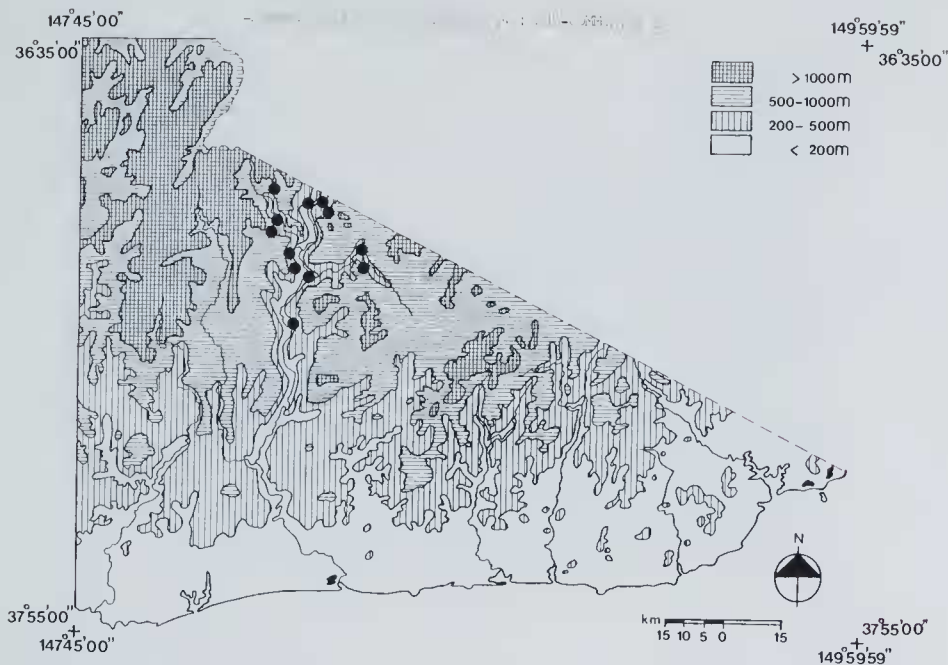
ALTITUDE: Mean = 590 m, Highest = 800 m, Lowest = 320 m.

STRUCTURE: Grassy low-woodland

MEAN FLORISTIC RICHNESS: 44 species per site

MEAN WEED COMPOSITION: 7% of species, 7% of cover

NOTES: A unique vegetation type in eastern Victoria which includes grasses common in the Central and Northern Plains (*Aristida ramosa*, *Dichanthium sericeum*, *Enneapogon nigricans*) but which are not frequent in Gippsland. Species other than grasses possess physical and physiological adaptations to the dry, nutrient-poor environment such as small sclerophyllous foliage (e.g. the heaths *Melichrus urceolatus*, *Lissanthe strigosa*) and an ability to rapidly respond to sporadic rains (e.g. *Cheilanthes tenuifolia*, a resurrection fern). The extent and floristic integrity of this sub-community has been severely reduced as a result of grazing.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Clematis microphylla</i>	100	1	<i>Agropyron scabrum</i>	73	1	<i>Cheilanthes tenuifolia</i>	60	1
<i>Eucalyptus albens</i>	93	2	<i>Cymbonotus preissianus</i>	67	+	<i>Brachychiton populneus</i>	60	+
<i>Lissanthe strigosa</i>	93	1	<i>Astroloma humifusum</i>	67	1	<i>Hydrocotyle hirta</i>	53	+
<i>Pea australis</i> spp. agg.	87	1	<i>Dichondra repens</i>	60	1	<i>Callitric columellaris</i>	53	1
* <i>Centaurium pulchellum</i>	73	1	<i>Senecio quadridentatus</i>	60	1	<i>Geranium potentilloides</i>	53	1

NO. OF SITES: 15 (3.9% of total)

DISTRIBUTION: Areas surrounding the upper Snowy River and its tributaries, particularly near Willis, Laguna Lugan and Tubbut.

ENVIRONMENT: Dry, gravelly sites within a range 500 m laterally and 150 m vertically from the river

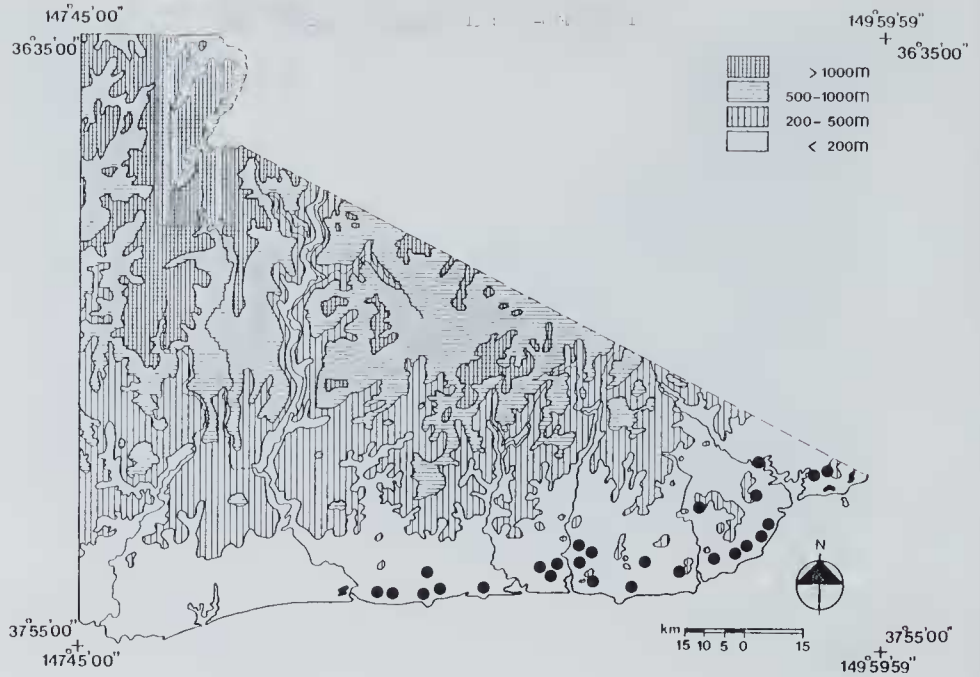
ALTITUDE: Mean: 403 m, highest: 600 m, lowest: 120 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 35 species per site

MEAN WEED COMPOSITION: 12% of species, 11% of cover

COMMENTS: Low-nutrient soils and steep slopes have diverted agricultural interest from this botanically interesting *Eucalyptus albens*/*Callitric columellaris* woodland. Historic exploitation of the *Callitric* trees has left few mature individuals. Regeneration of these conifers is at risk due to grazing by dense rabbit populations which also remove most of the softer ground-layer species. Ground cover is scant, annuals (*Senecio quadridentatus*) and short-lived weeds (*Centaurium pulchellum*) comprise most of this stratum. *Lissanthe strigosa* is ubiquitous and frequently the only shrub beneath the open canopy.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Xanthosia serrata</i>	93	1	<i>Xanthosia pilosa</i>	83	1	<i>Patersonia glabrata</i>	60	1
<i>Epacris impressa</i>	90	1	<i>Leptospermum juniperinum</i>	83	1	<i>Anisopogon avenaceus</i>	60	1
<i>Amperea xiphioclada</i>	87	1	<i>Dillwynia glaberrima</i>	80	1	<i>Leucopogon collinus</i>	57	1
<i>Dampiera stricta</i>	87	1	<i>Lomandra longifolia</i>	77	1	<i>Tetratheca pilosa</i>	57	1
<i>Cotus ericoides</i>	87	1	<i>Acacia terminalis</i>	77	1	<i>Monotoca scoparia</i>	53	+
<i>Pteridium esculentum</i>	87	1	<i>Correa reflexa</i>	73	1	<i>Leptospermum attenuatum</i>	53	1
<i>Casothyta glabella</i>	87	1	<i>Lepidosperma concavum</i>	70	1	<i>Platylobium formosum</i>	50	1
<i>Hicnocarpus pinifolius</i>	83	1	<i>Acacia suaveolens</i>	63	1	<i>Burchardia umbellata</i>	47	+
<i>Hicnocarpus tetracoides</i>	83	1	<i>Pimelea linifolia</i>	63	1	<i>Selaginella uliginosa</i>	47	1

NO. OF SITES: 30 (0.1% of total)

DISTRIBUTION: Coastal lowlands from the Snowy River east to the Victoria-N.S.W. border.

ENVIRONMENT: Inland from full oceanic influence, on siliceous sands

ELEVATION: Mean = 61 m, Highest = 180 m, Lowest = 0 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 42 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

REMARKS: Although no single species of eucalypt occurs in more than 30% of these sites, one or two species are usually present (e.g. *Eucalyptus globoides*, *E. gummifera*, *E. sicberi*, *E. consideriana*, *E. muelleriana* or *E. botryoides*). *E. gummifera* has its most southerly occurrence in far East Gippsland, and is Victoria's only member of the bloodwood group. A diverse shrub layer of small-leaved, sclerophyllous species is present (e.g. *Epacris impressa*, *Leptospermum juniperinum*) above a ground layer of monocotyledons (e.g. *Lepidosperma concavum*, *Anisopogon avenaceus*) and semi-shrubs (e.g. *Dampiera stricta*, *Amperea xiphioclada*). Areas of restricted drainage are indicated by the presence of *Selaginella uliginosa* and *Melaleuca squarrosa* in some quadrats. This woodland has little presently merchantable timber.





CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Acacia terminalis</i>	100	1	<i>Eucalyptus globoidea</i>	86	1	<i>Poa australis</i> spp. agg.	64	1
<i>Pteridium esculentum</i>	100	1	<i>Lomandra longifolia</i>	86	1	<i>Hibbertia empetrifolia</i>	64	1
<i>Tetratheca pilosa</i>	100	1	<i>Xanthosia pilosa</i>	66	1	<i>Leptospermum juniperinum</i>	64	1
<i>Epacris impressa</i>	93	1	<i>Tetrarrhena juncea</i>	79	1	<i>Paterosonia glabrata</i>	64	1
<i>Platylobium formosum</i>	93	1	<i>Anisopogon avenaceus</i>	79	1	<i>Platysace lanceolata</i>	64	1
<i>Amperea xiphiolada</i>	93	1	<i>Dillwynia glaberrima</i>	79	1	<i>Ricinocarpos pinifolius</i>	64	1
<i>Aotus ericoides</i>	93	1	<i>Persoonia linearis</i>	79	1	<i>Billardiera scandens</i>	57	+
<i>Banksia serrata</i>	93	1	<i>Pimelea linifolia</i>	79	1	<i>Lomatia ilicifolia</i>	57	1
<i>Dampiera stricta</i>	93	1	<i>Cassytha glabella</i>	71	+	<i>Scaevola ramosissima</i>	57	+
<i>Dianella caerulea</i>	93	1	<i>Eucalyptus sieberi</i>	71	2	<i>Eucalyptus corsideniana</i>	57	1
<i>Conocarpus teucrioides</i>	93	1	<i>Lepidosperma laterale</i>	71	1	<i>Leptospermum attenuatum</i>	57	1

NO. OF SITES: 14 (2.4% of total)

DISTRIBUTION: Coastal lowlands and foothills from the Snowy River east to the Victoria-N.S.W. border.

ENVIRONMENT: Siliceous sands

ALTITUDE: Mean = 91 m, Highest = 200 m, Lowest = 40 m.

STRUCTURE: Open-forest

MEAN FLORISTIC RICHNESS: 46 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: Sub-community 16.1 is floristically intermediate between sub-communities 15.1 and 16.2. The sub-community is grouped with Lowland Sclerophyllous Forest because of its structural affinity with that community (i.e. a high cover and consistent occurrence of eucalypts).



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Epacris impressa</i>	93	1	<i>Lepidosperma laterale</i>	81	1	<i>Patersonia glabrata</i>	59	1
<i>Conocarpus teucroides</i>	93	1	<i>Tetratheca pilosa</i>	78	1	<i>Lomandra longifolia</i>	59	1
<i>Persoonia linearis</i>	93	1	<i>Banksia serrata</i>	74	1	<i>Arisopogon avenaceus</i>	56	+
<i>Platylobium formosum</i>	93	1	<i>Poa australis</i> spp. agg.	70	1	<i>Cassytha phaeolasia</i>	56	1
<i>Amperea xiphioclada</i>	89	+	<i>Acacia terminalis</i>	67	1	<i>Pimelea humilis</i>	56	+
<i>Diarella caerulea</i>	89	1	<i>Eucalyptus globoidea</i>	67	1	<i>Banksia spinulosa</i>	56	1
<i>Lomatia ilicifolia</i>	89	1	<i>Acacia myrtifolia</i>	67	1	<i>Leptospermum juniperinum</i>	52	+
<i>Eucalyptus sieberi</i>	85	2	<i>Lindsaya linearis</i>	63	+	<i>Danthonia pallida</i>	52	1
<i>Pteridium esculentum</i>	85	1	<i>Hakea sericea</i>	63	1	<i>Correa reflexa</i>	48	+
<i>Dampiera stricta</i>	85	1	<i>Scaevola ramosissima</i>	63	1	<i>Lycopodium deuterodensum</i>	48	1
<i>Tetrarrhena juncea</i>	85	1	<i>Billardiera scandens</i>	63	+	<i>Eucalyptus considianiana</i>	48	1
<i>Cautis flexuosa</i>	81	1	<i>Burchardia umbellata</i>	63	+	<i>Xanthosia tridentata</i>	48	+
<i>Hibbertia empetrifolia</i>	81	1						

NO. OF SITES: 27 (4.6% of total)

DISTRIBUTION: Coastal lowlands and foothills of Murrumbidgee and Cann River districts, also an isolated occurrence near Tostaree

ENVIRONMENT: Siliceous sands

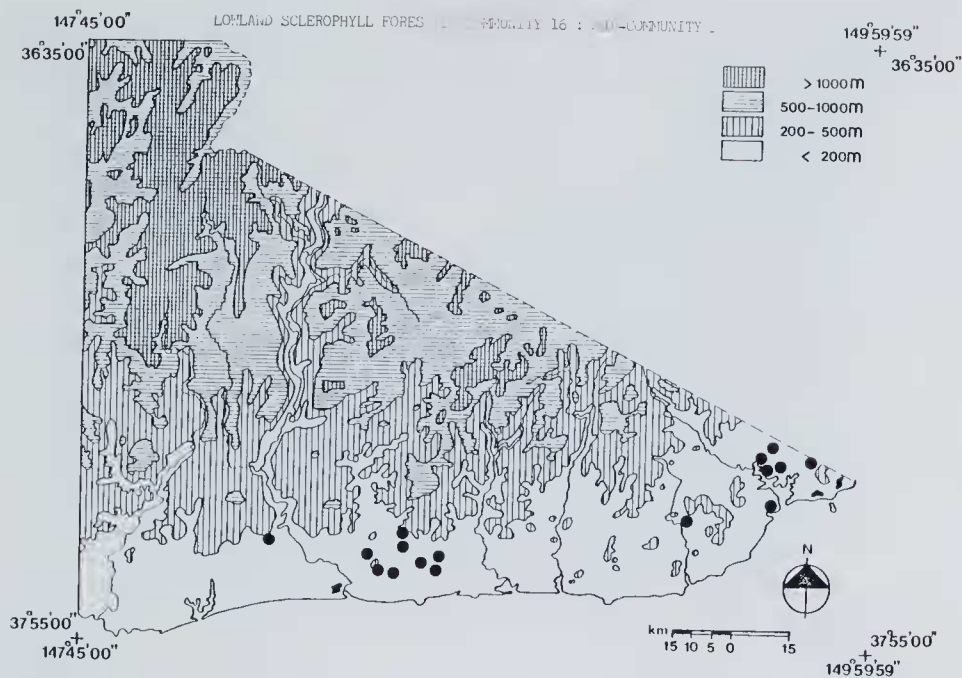
ALTITUDE: Mean = 137 m, Highest = 320 m, Lowest = 60 m.

STRUCTURE: Open-forest

MEAN FLORISTIC RICHNESS: 50 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: The understory of this sub-community forms an open scrub above a shrub layer typical of Lowland Sclerophyllous Forest. The scrub is mostly comprised of members of the Proteaceae. These are significant for nectariferous animals, supplying nectar through much of the year. *Banksia spinulosa* is winter flowering, *Hakea sericea* flowers in spring, whilst *B. serrata* and *Persoonia linearis* flower in summer. Monocotyledons and semi-shrubs, including showy-flowering species such as *Dampiera stricta* and *Scaevola ramosissima* make up the ground layer. Of the four species of grass, the scrambling wire grass, *Tetrarrhena juncea*, and the broad-leaved oat spear grasses *Danthonia pallida* and *Poa australis* spp. agg. may be confused with each other. *Lycopodium deuterodensum* may grow to 1 m and has the appearance of a small pine tree. It is a member of the primitive Lycopodiinae, a group with few extant species. The opportunistic species, *Platylobium formosum*, *Pteridium esculentum* and *T. juncea* examined in conjunction have significant cover values, and disturbance probably by fire is implied.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Dianella caerulea</i>	94	1	<i>Billardiera scandens</i>	76	1	<i>Scaevola ramosissima</i>	65	+
<i>Gonocarpus tectrioides</i>	94	1	<i>Poa australis</i> spp. agg.	76	1	<i>Goodenia ovata</i>	65	+
<i>Dampiera stricta</i>	88	1	<i>Patersonia glabrata</i>	71	1	<i>Hypericum gramineum</i>	65	+
<i>Tetratheca pilosa</i>	88	1	<i>Entolasia marginata</i>	71	1	<i>Leptospermum juniperinum</i>	65	1
<i>Epacris impressa</i>	88	1	<i>Lomandra longifolia</i>	71	1	<i>Lomandra filiformis</i>	59	1
<i>Lepidosperma laterale</i>	88	1	<i>Hibbertia empetrifolia</i>	71	1	<i>Acrotriche serrulata</i>	59	+
<i>Personia linearis</i>	88	1	<i>Viola hederacea</i>	71	1	<i>Lindsaya linearis</i>	59	1
<i>Pteridium esculentum</i>	88	1	<i>Gahnia sieberana</i>	65	1	<i>Pimelea humilis</i>	59	+
<i>Deyeuxia quadrisetata</i>	82	+	<i>Xanthorrhoea minor</i>	65	1	<i>Eucalyptus muelleriana</i>	59	1
<i>Eucalyptus sieberi</i>	82	1	<i>Acacia myrtifolia</i>	65	1	* <i>Hypochoeris radicata</i>	53	+
<i>Burchardia umbellata</i>	76	+	<i>Platylobium formosum</i>	65	1	<i>Eucalyptus globoidea</i>	53	1
<i>Tetrarrhena juncea</i>	76	1	<i>Lomata ilicifolia</i>	65	+			

NO. OF SITES: 16 (2.9% of total)

DISTRIBUTION: Coastal lowlands, in Marlo and Mallacoota districts.

ENVIRONMENT: Siliceous sands and clay-loams

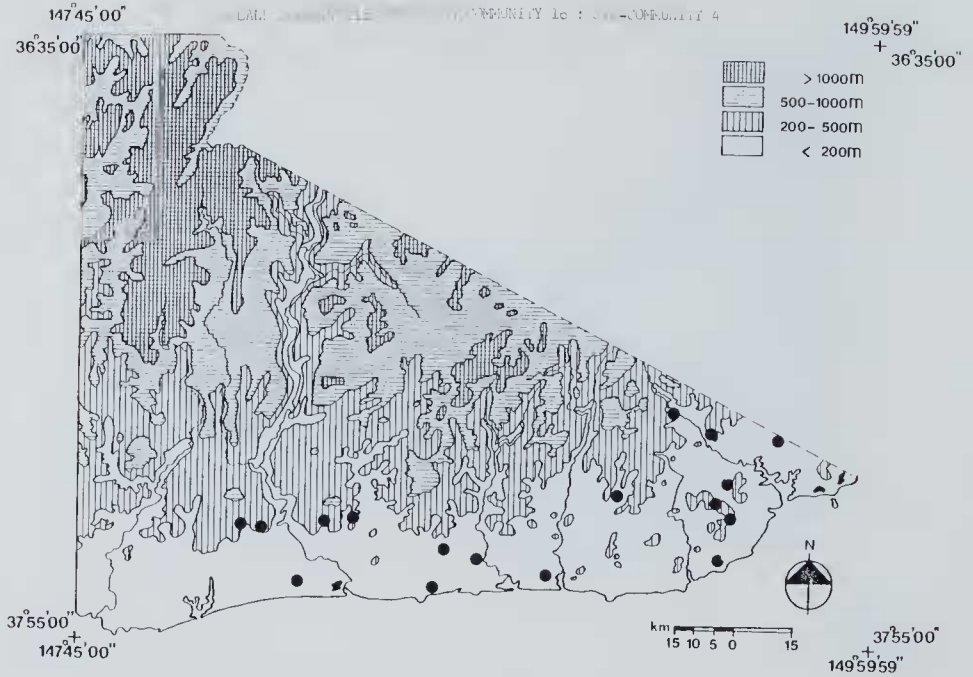
ALTITUDE: Mean = 84 m, Highest = 200 m, Lowest = 0 m.

STRUCTURE: Open-forest

MEAN FLORISTIC RICHNESS: 57 species per site

MEAN WEED COMPOSITION: 1% of species, 1% of cover

NOTES: *Eucalyptus muelleriana* shares the tree canopy with *E. sieberi* and *E. globoidea* on clay-loams. A shrub layer of small-leaved sclerophyllous species occurs above a ground layer of semi-shrubs (e.g. *Dampiera stricta*, *Hibbertia empetrifolia*) and monocotyledons (e.g. *Lepidosperma laterale*, *Patersonia glabrata*). One of the few herbs present is *Hypochoeris radicata*, and it constitutes the only occurrence of an introduced character species in this Lowland Sclerophyllous Forest. The opportunistic species, *Pteridium esculentum* and *Tetrarrhena juncea* examined in conjunction have significant cover values, and disturbance, probably by fire, is implied. Nevertheless sub-community 16.2 has the highest mean floristic richness within community 16. *T. juncea* is often tangled with *Entolasia marginata*, a species of quite similar appearance.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Epacris impressa</i>	100	1	<i>Poa australis</i> spp. agg.	76	1	<i>Helichrysum scorpioides</i>	59	+
<i>Gonocarpus teucrioides</i>	94	1	<i>Tetradthea pilosa</i>	76	1	<i>Billardiera scandens</i>	53	+
<i>Dianella caerulea</i>	88	1	<i>Dampiera stricta</i>	71	1	<i>Cassytha phaeolasia</i>	53	1
<i>Lepidosperma laterale</i>	88	+	<i>Acacia terminalis</i>	71	1	<i>Platysace lanceolata</i>	53	+
<i>Lomandra longifolia</i>	82	+	<i>Persoonia linearis</i>	71	1	<i>Leucopogon lanceolatus</i>	53	+
<i>Pteridium esculentum</i>	82	1	<i>Tetrarrhena juncea</i>	71	1	<i>Paterosonia glabrata</i>	53	+
<i>Eucalyptus globoidea</i>	82	1	<i>Viola hederacea</i>	65	+	<i>Platylobium formosum</i>	53	1
<i>Hibbertia empetrifolia</i>	76	+	<i>Amperea xiphoclada</i>	59	+	<i>Scaevola ramosissima</i>	53	+
<i>Eucalyptus sieberi</i>	76	1						

NO. OF SITES: 17 (2.9% of total)

DISTRIBUTION: Coastal lowland and foothills, from the Snowy River east to the Victoria-N.S.W. border.

ENVIRONMENT: Siliceous sands

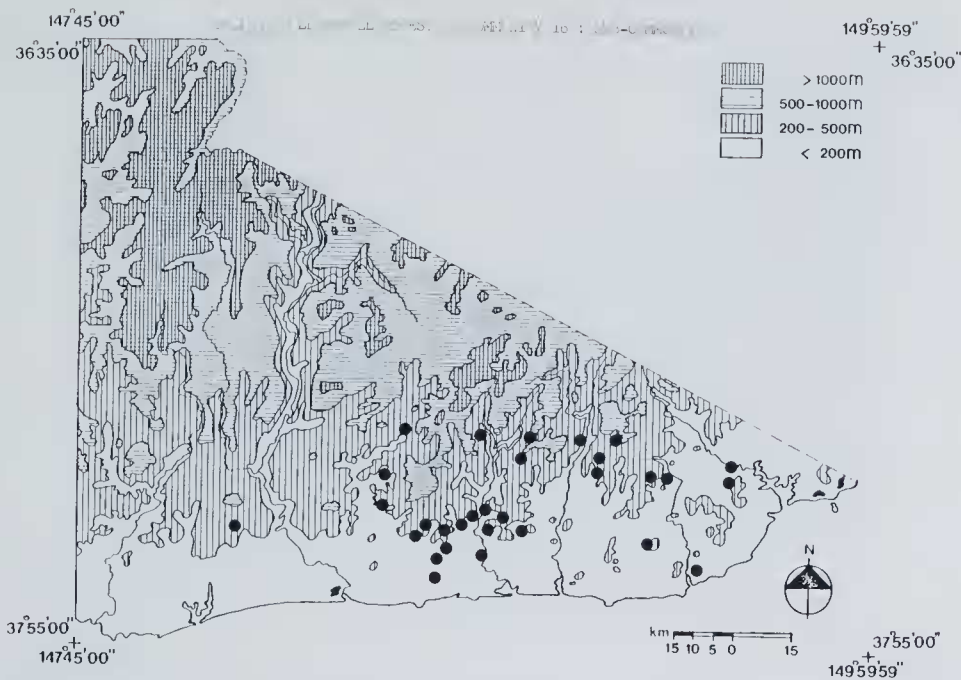
ALTITUDE: Mean = 140 m. Highest = 280 m. Lowest = 0 m.

STRUCTURE: Open-forest

MEAN FLORISTIC RICHNESS: 50 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: As in all other sub-communities of community 16, *Eucalyptus sieberi* and *E. globoidea* are the major tree species. A floristically rich shrub layer (e.g. *Epacris impressa*, *Acacia botryocephala*) is developed over a range of semi-shrubs (e.g. *Tetradthea pilosa*, *Hibbertia empetrifolia*) and monocotyledons (e.g. *Dianella caerulea*, *Lepidosperma laterale*). *Cassytha phaeolasia*, a leafless parasitic twiner confined in Victoria to East Gippsland grows in tangles over host species.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Tetrarrhena juncea</i>	94	2	<i>Eucalyptus globoides</i>	77	1	<i>Amperea xiphioclada</i>	55	+
<i>Conocarpus teucroides</i>	94	1	<i>Epacris impressa</i>	74	1	<i>Blechnum cartilagineum</i>	55	1
<i>Pteridium esculentum</i>	90	1	<i>Persoonia linearis</i>	74	1	<i>Alsophila australis</i>	55	+
<i>Dianella caerulea</i>	90	1	<i>Hibbertia empetrifolia</i>	71	1	<i>Lomatia ilicifolia</i>	55	1
<i>Viola hederacea</i>	87	+	<i>Leucopogon lanceolatus</i>	71	1	<i>Lomandra longifolia</i>	52	1
<i>Billardiera scandens</i>	81	+	<i>Acacia mucronata</i>	68	1	<i>Eucalyptus obliqua</i>	52	1
<i>Goodenia ovata</i>	81	1	<i>Lepidosperma laterale</i>	68	1	<i>Cassinia longifolia</i>	48	+
<i>Cassityha phaeolasia</i>	77	1	<i>Poa australis</i> spp. agg.	61	1	<i>Tylophora barbata</i>	48	1
<i>Eucalyptus sieberi</i>	77	2	<i>Gahnia sieberana</i>	61	1	<i>Daviesia ulicifolia</i>	48	1
<i>Hierochloa rariflora</i>	77	1	<i>Correa reflexa</i>	58	1	<i>Culcita dubia</i>	45	1
<i>Tetratheca pilosa</i>	77	1	<i>Platylobium formosum</i>	58	1	<i>Pultenaea daphnoides</i>	45	1

NO. OF SITES: 31 (5.3% of total)

DISTRIBUTION: Coastal lowland and foothills, from the Snowy River east to the Victoria-N.S.W. border.

ENVIRONMENT: Siliceous sands and sandy-loams, often in minor gullies

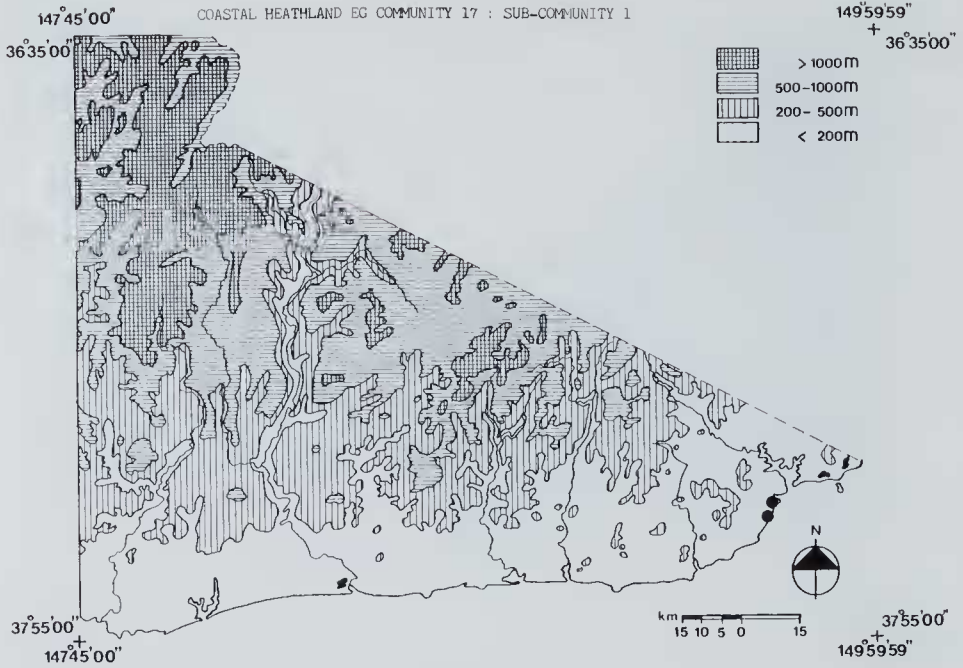
ALTITUDE: Mean = 207 m, Highest = 440 m, Lowest = 40 m.

STRUCTURE: Open-forest to Tall open-forest

MEAN FLORISTIC RICHNESS: 48 species per site

MEAN WEED COMPOSITION: 1% of species, 0% of cover

NOTES: The occurrence of *Eucalyptus obliqua* in this sub-community, along with the ferns *Culcita dubia*, *Alsophila australis* and *Blechnum cartilagineum*, suggest a relationship with the higher altitude forests such as those of community 13.1. The shrub layer has a significant complement of opportunistic species (e.g. *Pteridium esculentum*, *Goodenia ovata*, *Acacia mucronata*, *Platylobium formosum*, *Gahnia sieberana*, *Cassinia longifolia*) which often occur with high cover values suggesting disturbance as a result of fire or forestry operations. The attractive, coumarin-scented grass, *Hierochloa rariflora* and the robust, tangled wire-grass *Tetrarrhena juncea* may also form unbroken swards after disturbance.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Acacia myrtifolia</i>	100	+	<i>Linosaya linearis</i>	100	1	<i>Pimelea linifolia</i>	67	1
<i>Banksia marginata</i>	100	+	<i>Patersonia glabrata</i>	100	1	<i>Poa australis</i> spp. agg.	67	1
<i>Bosiacea prostrata</i>	100	+	<i>Scaevola ramosissima</i>	100	+	<i>Stipa nervosa</i>	67	1
<i>Burchardia umbellata</i>	100	1	<i>Schoenus apogon</i>	100	+	<i>Stipa semibarbata</i>	67	1
<i>Casothyta glabell</i>	100	1	<i>Schoenus brevifolius</i>	100	1	<i>Acrotiche serrulata</i>	67	1
<i>Casuarina paludosa</i>	100	1	<i>Schaerolobium vimineum</i>	100	1	<i>Amperea xiphioclada</i>	67	+
<i>Dampiera stricta</i>	100	+	<i>Themeda australis</i>	100	1	<i>Empodisma minus</i>	67	1
<i>Danthonia pilosa</i>	100	1	<i>Thysanotus juncifolius</i>	100	+	<i>Comesperma ericinum</i>	67	1
<i>Gillwynia sericea</i>	100	1	<i>Xanthosia pusilla</i>	100	+	<i>Gahnia radula</i>	67	1
<i>Entolasia marginata</i>	100	+	<i>Anisopogon avenaceus</i>	67	2	<i>Goodenia ovata</i>	67	1
<i>Epacris impressa</i>	100	1	<i>Astroloma humifusum</i>	67	1	<i>Hibbertia empetrifolia</i>	67	1
<i>Gompholobium huegelii</i>	100	1	<i>Chamaescilla corymbosa</i>	67	1	<i>Platysace heterophylla</i>	67	1
<i>Gonocarpus teucrioides</i>	100	1	<i>Cyathochaeta diandra</i>	67	1	<i>Platysace lanceolata</i>	67	1
<i>Helichrysum scorpioides</i>	100	+	<i>Drosera auriculata</i>	67	+	<i>Schoenus tenuissimus</i>	67	1
<i>Laxmannia sessiliflora</i>	100	+	<i>Euphrasia collina</i>	67	1	<i>Selaginella uliginosa</i>	67	1
<i>Leptosperma neesii</i>	100	1	<i>Lomandra filiformis</i>	67	+	<i>Xanthosia dissecta</i>	67	+
<i>Leptosperma juniperinum</i>	100	1	<i>Opercularia varia</i>	67	+			

NO. OF SITES: 3 (0.5% of total)

DISTRIBUTION: Restricted to near-coastal plains between Betka River and Seal Creek.

ENVIRONMENT: Cliff-top plateau within 1 km of the sea. Buffered from strong, salt-laden winds by sea cliff and a dense band of shrubland vegetation (such as 19.1 and 20.1)

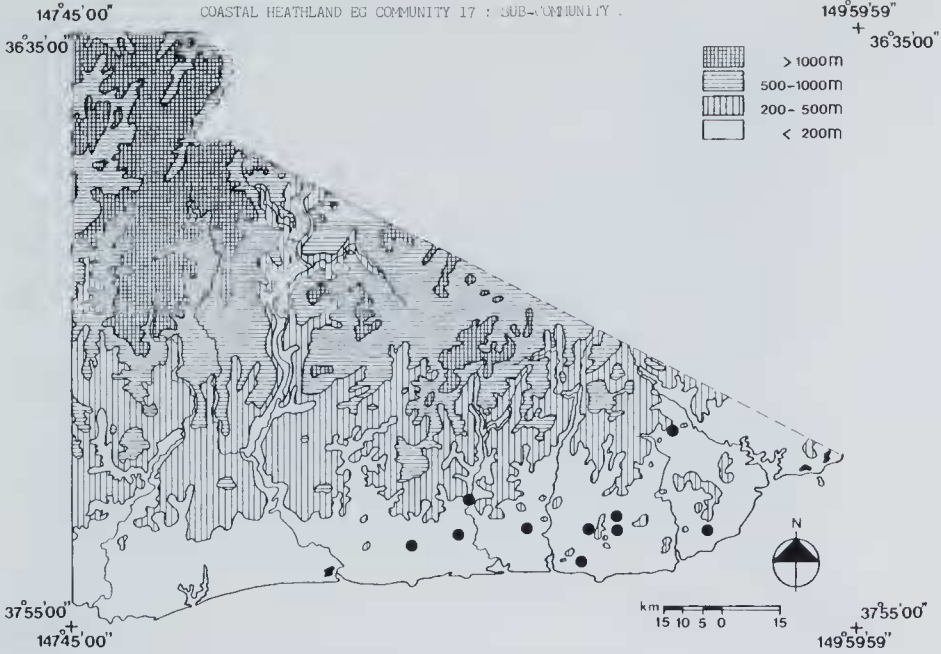
ALTITUDE: Mean = 30 m, Highest = 40 m, Lowest = 20 m.

STRUCTURE: Open-heath

MEAN FLORISTIC RICHNESS: 44 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: Grasses, sedges and lilies form an unusually high proportion of the species in this coastal heath sub-community. Character species, *Cyathochaeta diandra* and *Thysanotus juncifolius*, are rare in Victoria and restricted to this region. *Spyridium cinereum*, a species of very disjunct distribution, is found only here and in the north-eastern Grampians.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Selaginella uliginosa</i>	100	1	<i>Epacris impressa</i>	73	1	<i>Lindsaya linearis</i>	64	1
<i>Xanthorrhoea hastilis</i>	100	2	<i>Burchardia umbellata</i>	73	+	<i>Gahnia clarkel</i>	55	1
<i>Dampiera stricta</i>	91	1	<i>Epacris obtusifolia</i>	73	1	<i>Banksia serrata</i>	55	1
<i>Melaleuca squarrosa</i>	91	2	<i>Dillwynia glaberrima</i>	64	1	<i>Comesperma ericinum</i>	55	1
<i>Leptospermum juniperinum</i>	91	1	<i>Gonocarpus teucrioides</i>	64	+	<i>Lepidosperma filiforme</i>	55	2
<i>Empodisma minus</i>	82	1	<i>Gahnia sieberana</i>	64	1	<i>Sprengelia incarnata</i>	55	1
<i>Cassytha glabella</i>	82	1	<i>Aotus ericoides</i>	64	+			

NO. OF SITES: 10 (1.7% of total)

DISTRIBUTION: Frequent between Marlo and Little Ram Head and up to 20 km inland, with an outlying occurrence west of the Genoa River near Wangarabell.

ENVIRONMENT: Depressions and poorly drained plains within undulating, near-coastal regions. Soil: are generally peaty sands

ALTITUDE: Mean = 89 m, Highest = 120 m, Lowest = 20 m.

STRUCTURE: Closed-heath

MEAN FLORISTIC RICHNESS: 42 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: This distinct vegetation type, restricted in Victoria to East Gippsland, is widely known as "grass-tree plain" and dominated by *Xanthorrhoea hastilis* (Spear Grass-tree). This sub-community lacks any arboresecent plants and is often extensive. Despite frequent burning and seasonal grazing, many ephemeral species and orchids persist in this sub-community (e.g. *Drosera*, *Utricularia* and *Prasophyllum* spp.).



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Xanthorrhoea hastilis</i>	100	2	<i>Burchardia umbellata</i>	75	+	<i>Xyris operculata</i>	67	1
<i>Casuarina paludosa</i>	92	1	<i>Cassytha glabella</i>	75	+	<i>Lindsaya linearis</i>	67	1
<i>Leptocarpus tenax</i>	92	1	<i>Dampiera stricta</i>	75	+	<i>Gonocarpus teucrioides</i>	58	1
<i>Leptospermum juniperinum</i>	92	1	<i>Hakea teretifolia</i>	75	1	<i>Gahnia sieberana</i>	58	1
<i>Empodisma minus</i>	83	1	<i>Lepidosperma filiforme</i>	75	1	<i>Patersonia fragilis</i>	58	1
<i>Restio complanatus</i>	83	1	<i>Epacris impressa</i>	67	1	<i>Tetraria capillaris</i>	58	1
<i>Selaginella uliginosa</i>	83	1	<i>Sprengelia incarnata</i>	67	1	<i>Tetrarrhena distichophylla</i>	58	1

NO. OF SITES: 13 (2.2% of total)

DISTRIBUTION: Near-coastal plains between Marlo and Bemm River, but extending to 30 km inland near Genoa.

ENVIRONMENT: Damp depressions within near-coastal plains. Soils are of peaty sands or deep siliceous sand on hardpan base

ALTITUDE: Mean = 80 m, Highest = 160 m, Lowest = 40 m.

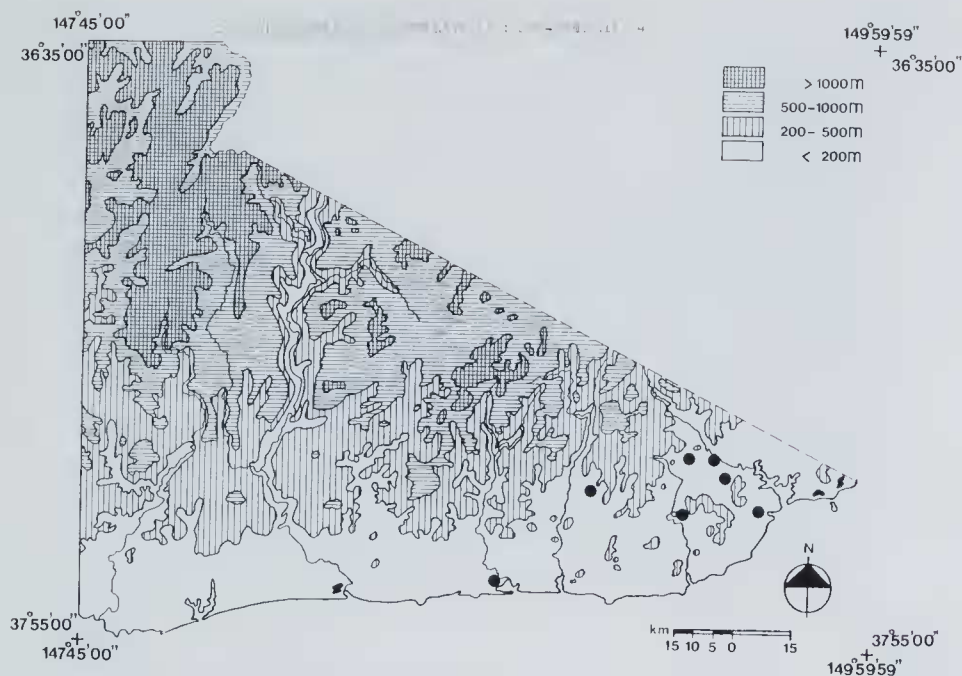
STRUCTURE: Closed-heath

MEAN FLORISTIC RICHNESS: 43 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: A version of grass-tree plain in which both *Casuarina paludosa* and *Xanthorrhoea hastilis* constitute the major species. This vegetation type occupies wetter sites than those supporting sub-community 17.2 a feature reflected in the presence of *C. paludosa* and other wetland species such as *Xyris operculata*, *Patersonia fragilis* and *Sprengelia incarnata*.





CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Epodisma minus</i>	100	1	<i>Epacris lanuginosa</i>	83	1	<i>Lindsaya linearis</i>	67	1
<i>Cassytha glabella</i>	100	+	<i>Lomandra longifolia</i>	83	1	<i>Callistemon citrinus</i>	67	1
<i>Casuarina paludosa</i>	100	1	<i>Amperea xiphioclada</i>	67	+	<i>Hakea teretifolia</i>	67	1
<i>Leptospermum juniperinum</i>	100	1	<i>Anisopogon avenaceus</i>	67	+	<i>Hypericum gramineum</i>	67	1
<i>Selaginella uliginosa</i>	100	1	<i>Burchardia umbellata</i>	67	+	<i>Lepidosperma neesii</i>	67	+
<i>Banksia serrata</i>	83	1	<i>Eucalyptus globoidea</i>	67	1	<i>Sphaerolobium vimineum</i>	67	1
<i>Vampiera stricta</i>	83	1	<i>Conocarpus teucroides</i>	67	1			

NO. OF SITES: 6 (1.0% of total)

DISTRIBUTION: Uncommon from Marlo to Cape Conrar, and scattered between Cann River, Genoa and Mallacoota.

ENVIRONMENT: Near Marlo, immediately leeward of the foredunes, otherwise in damp depressions of the near-coastal plains

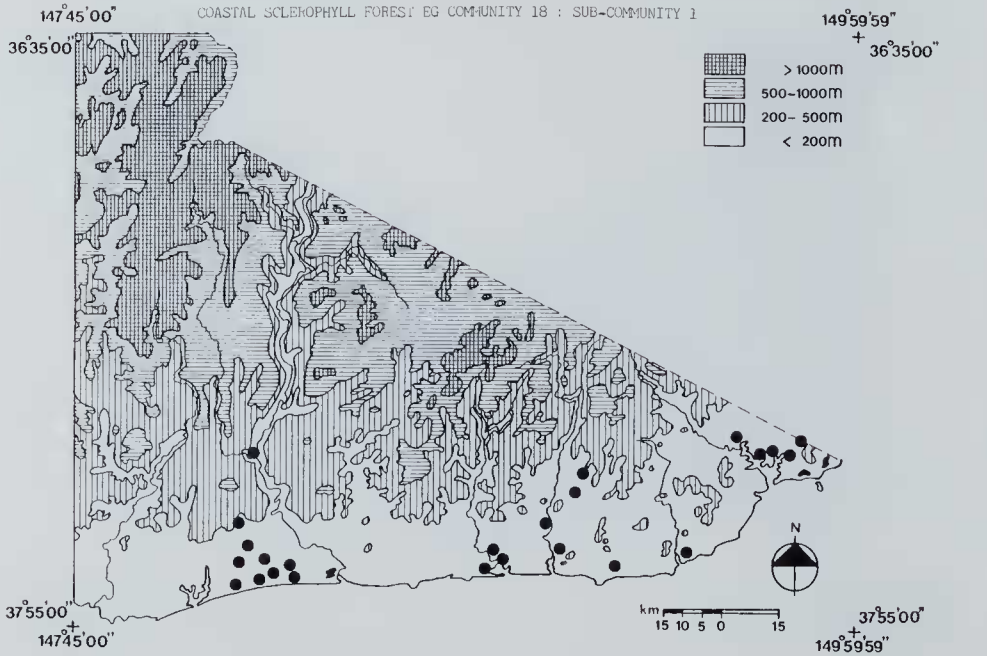
ALTITUDE: Mean = 76 m, Highest = 120 m, Lowest = 40 m.

STRUCTURE: Closed-heath

MEAN FLORISTIC RICHNESS: 56 species per site

MEAN WEED COMPOSITION: 0% of species, 0% of cover

NOTES: This sub-community, dominated by *Casuarina paludosa*, replaces the grass-tree plain vegetation in wetter areas of deep sandy soils. Sub-community 17.4 has greater floristic affinities with the surrounding open-forest than do 17.1, 17.2 or 17.3. *Banksia serrata*, *Conocarpus teucroides*, *Lomandra longifolia* and *Pteridium esculentum* are some of the species shared with the forest. On exposed, sea-facing slopes the height of the tallest plants of this vegetation may not exceed 0.5 m, but sheltered sites, such as dune swales, may support much taller (to 1.5 m) vegetation.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Pteridium esculentum</i>	90	1	<i>Microlaena stipoides</i>	59	+	<i>Glycine clandestina</i>	48	1
<i>Viola hederacea</i>	79	+	<i>Poa australis</i> spp. agg.	59	1	<i>Dianella caerulea</i>	48	1
<i>Lomandra longifolia</i>	76	1	<i>Tylophora barbata</i>	55	1	<i>Echinopogon ovatus</i>	48	+
<i>Juncocarpus tetracoides</i>	69	1	<i>Geranium potentilloides</i>	52	+	<i>Galium gaudichaudii</i>	48	+
<i>Eucalyptus botryoides</i>	66	1	<i>Dichondra repens</i>	52	+			

NO. OF SITES: 28 (4.9% of total)

DISTRIBUTION: Common in near-coastal regions and around the lower reaches of the Snowy, Cann, Berrin and Genoa Rivers.

ENVIRONMENT: Moist, sheltered sites throughout the lowlands

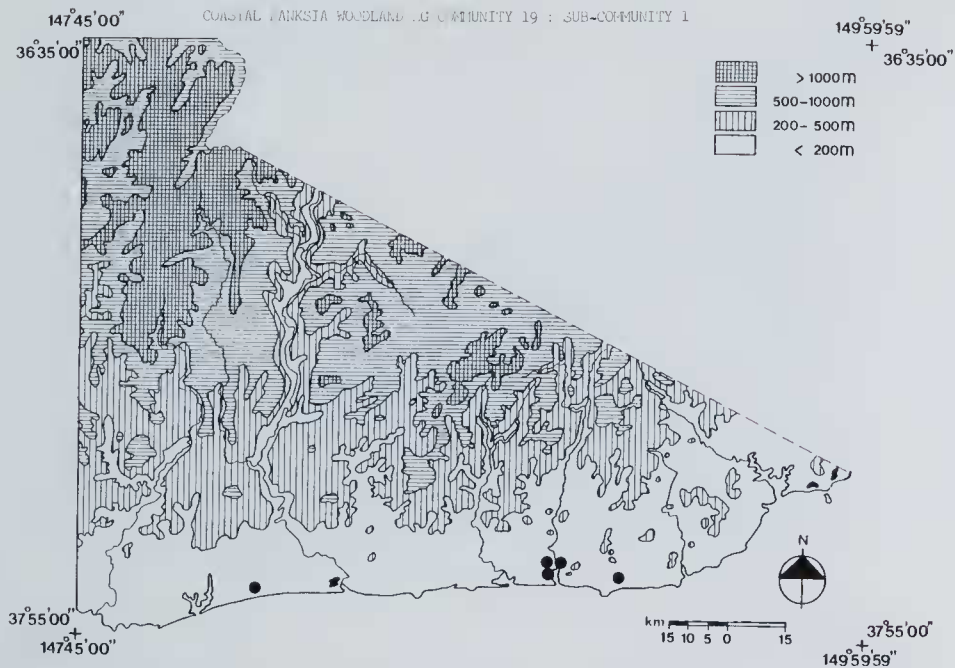
ALTITUDE: Mean = 32 m, Highest = 80 m, Lowest = 0 m.

STRUCTURE: Open-forest

MEAN FLORISTIC RICHNESS: 47 species per site

MEAN WEED COMPOSITION: 4% of species, 3% of cover

NOTE: This riparian sub-community also contains elements of heathland and coastal open-forest communities. This feature is indicative of the environment of this sub-community. Riparian lowland vegetation in Victoria has largely disappeared in the wake of agricultural pursuits. This sub-community although comprising few rare or restricted species, is therefore an example of a diminishing vegetation type within the state.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Banksia integrifolia</i>	100	1	<i>Eucalyptus botryoides</i>	86	1	<i>Lepidosperma concavum</i>	71	1
<i>Dianella tasmanica</i>	100	+	<i>Pteridium esculentum</i>	86	1	<i>Melaleuca ericifolia</i>	71	1
<i>Gonocarpus reticulatus</i>	100	1	<i>Banksia serrata</i>	71	1	<i>Amperea xiphioclada</i>	57	1
<i>Lomandra longifolia</i>	100	+	<i>Ricinocarpus pinifolius</i>	71	+	<i>Goodenia ovata</i>	57	1
<i>Cassytha phaeolasia</i>	86	+	<i>Acacia longifolia</i>	71	1	<i>Melaleuca squarrosa</i>	57	1
<i>Gahnia clarkei</i>	86	2	<i>Epacris impressa</i>	71	1	<i>Tetrarrhena juncea</i>	57	1
<i>Monotoca elliptica</i>	86	1	<i>Pultenaea saphnoides</i>	71	+	<i>Dianella caerulea</i>	57	+
<i>Platylobium formosum</i>	86	+	<i>Gonocarpus teucrioides</i>	71	1	<i>Poa australis</i> spp. aff.	57	1

NO. OF SITES: 7 (1.3% of total)

DISTRIBUTION: Recorded only between Tamboon Inlet and the mouth of the Thurra River but probably more widespread than sampling indicates.

ENVIRONMENT: Areas of drainage or inundation with a strong coastal influence but sheltered from direct ocean winds

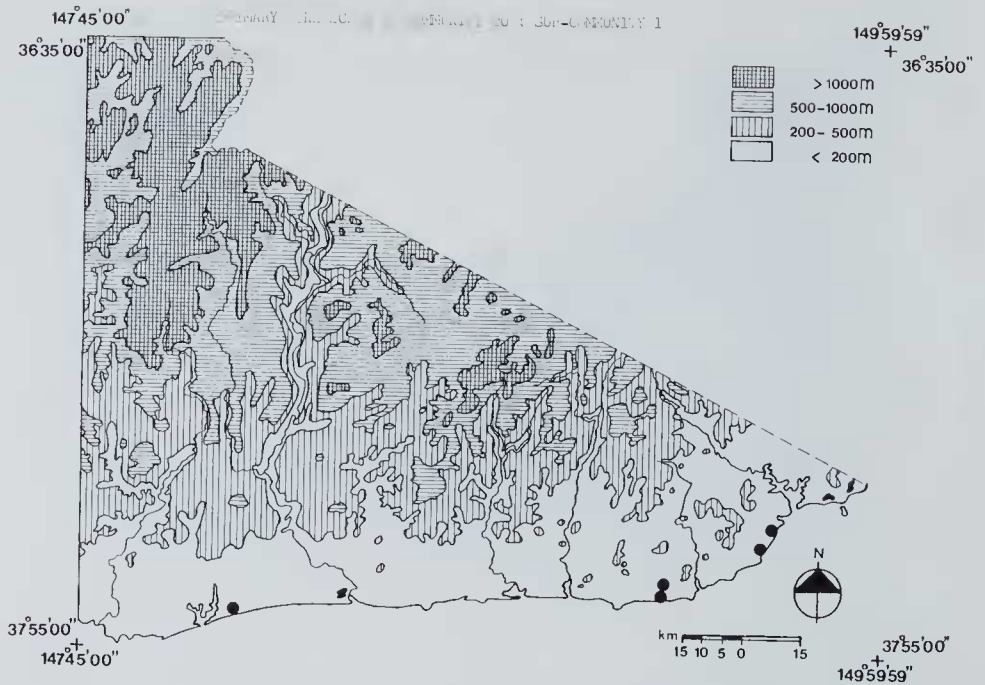
ALTITUDE: Mean = 30 m, Highest = 40 m, Lowest = 10 m.

STRUCTURE: Woodland

MEAN FLORISTIC RICHNESS: 50 species per site

MEAN WEED COMPOSITION: 4% of species, 3% of cover

NOTES: Dense thickets of *Melaleuca ericifolia*, *M. squarrosa* and *Gahnia clarkei* are a constituent of this *Banksia integrifolia* - *Eucalyptus botryoides* woodland. Within these thickets, species numbers are low and a large complement of the species at any site are those which occur more commonly within the surrounding vegetation.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Carpobrotus rossii</i>	100	1	<i>Myoporum insulare</i>	83	1	<i>Spinifex hirsutus</i>	67	1
<i>Helichrysum paraliium</i>	100	1	<i>Senecio lautus</i>	83	+	<i>Acaena anserinifolia</i>	67	1
<i>Leptospermum laevigatum</i>	100	1	<i>Acacia longifolia</i>	67	2	<i>Correa alba</i>	67	1
<i>Calceophalus brownii</i>	83	1	<i>Olearia axillaris</i>	67	1	<i>Oxalis corniculata</i>	67	+
<i>Banksia integrifolia</i>	83	1	<i>Actites megalocarpus</i>	67	+	<i>Scirpus nodosus</i>	67	1

NO. OF SITES: 6 (1.0% of total)

DISTRIBUTION: Along the coast throughout the study area.

ENVIRONMENT: Exposed foredunes or seacliffs with substrates, respectively, of pure calcareous sand or sedimentary rock

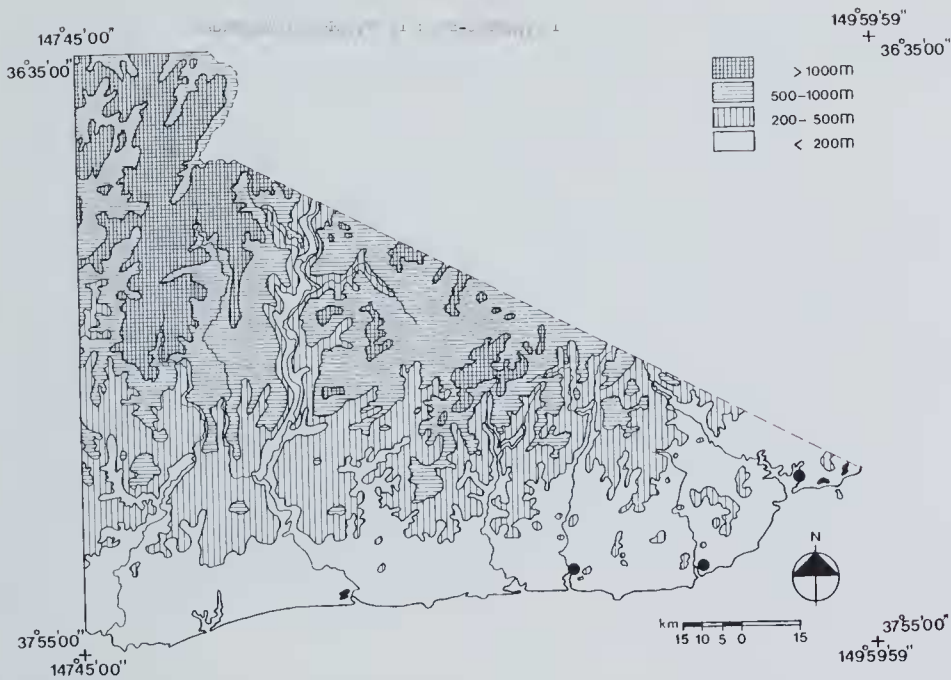
ALTITUDE: Mean = 20 m, Highest = 40 m, Lowest = 0 m.

STRUCTURE: Low-shrubland

MEAN FLORISTIC RICHNESS: 27 species per site

MEAN WEED COMPOSITION: 4% of species, 2% of cover

NOTES: This is a floristically depauperate sub-community but one which is well-adapted to the exposed, seafront environment. It is widespread along the Victorian coastline throughout which range the species composition is largely unaltered. The rhizomatous growth habit of some, and extensive root systems of most species of sub-community 20.1 contribute to the important function of dune stabilization. The protection from strong, salt winds afforded by the foredunes is essential for the maintenance of communities further inland.



CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A	CHARACTER SPECIES	% FREQ	C/A
<i>Juncus kraussii</i>	100	2	<i>Melaleuca ericifolia</i>	67	2	<i>Carpobrotus rossii</i>	67	+
<i>Samolus repens</i>	100	1	<i>Apium prostratum</i>	67	1	<i>Salicornia quinqueflora</i>	67	2
<i>Selliera radicans</i>	100	+	* <i>Aster subulatus</i>	67	1	<i>Suaeda australis</i>	67	1
<i>Baumea juncea</i>	67	2						

NO. OF SITES: 3 (0.5% of total)

DISTRIBUTION: Restricted to the estuaries of the Bemm, Cann, Hueller, Wingan and Genoa Rivers.

ENVIRONMENT: Alluvial muds or silts bordering sheltered shallow waters of variable salinity

ALTITUDE: 0 m.

STRUCTURE: Tussock-grassland and intersecting herbland

MEAN FLORISTIC RICHNESS: 18 species per site

MEAN WELD COMPOSITION: 8% of species, 4% of cover

NOTES: This sub-community, dominated by *Juncus kraussii* occupies the same zone as the saltmarsh communities (i.e. between shorefront and *Melaleuca ericifolia* shrubland) common elsewhere in Victoria. Shrubby plants (particularly *Arthrocnemum* spp.) dominate the latter communities but are absent from 21.1. However, most species characteristic of 21.1 (*Apium prostratum*, *Samolus repens*, *Selliera radicans*, *Salicornia quinqueflora*, *Suaeda australis*) are common in saltmarsh vegetation.

